

ATTACHMENT R

SITE CHARACTERIZATION DATA SUMMARY REPORT

***GEOMORPH[®] SITE CHARACTERIZATION
UPPER TITTABAWASSEE RIVER***



290 South Wagner Road
Ann Arbor, Michigan 48103
Tel. 734/995-0995 Fax. 734/995-3731
Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach A

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RA-4+25-IC-C | 8/14/2006 | 0.0-0.1 | in-channel | 10YR 3/2 very dark grayish br very fine sand, wet, moist, friable, slightly plastic, trace organic matter, trace coarse sand | 1 | -- | 24.2 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RA-4+25-IC-C | 8/14/2006 | 0.8-0.9 | in-channel | N 2/0 black and 10YR 4/1 dark gray sand, wet, subangular blocky, moist, loose, Non-plastic, very fine black sand, medium to fine gravel gray sand, non-cohesive, subrounded to subangular grains, poorly sorted, trace freshwater shells Lab Duplicate | 4 | -- | 13.7 | <4 | <4 | <4 | <4 | <10 ^{LISR} | <26 | <10 | Dow |
| RA-4+25-IC-C | 8/14/2006 | 0.8-0.9 Lab Duplicate | in-channel | N 2/0 black and 10YR 4/1 dark gray sand, wet, subangular blocky, moist, loose, Non-plastic, very fine black sand, medium to fine gravel gray sand, non-cohesive, subrounded to subangular grains, poorly sorted, trace freshwater shells Lab Duplicate | 4 | -- | 8.8 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RA-4+25-IC-NE | 8/31/2006 | 0.0-0.4 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains | 1 | SP | 22.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RA-4+25-IC-NE | 8/31/2006 | 0.4-2.0 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, granular, moist, loose, Non-plastic, many very fine roots, fine granular structure, cohesive, many very fine, fine, medium, and coarse roots | 2 | SM | 33.3 | <4 | <4 | <4 | <4 | 5 | <20 [*] | <10 [*] | Alta |
| RA-4+25-IC-NE | 8/31/2006 | 2.0-5.9 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains | 3 | SP | 13.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RA-4+25-IC-NE | 8/31/2006 | 5.9-6.0 | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common medium roots, non-cohesive, subrounded grains | 4 | SM | 55 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RA-9+50-IC-C | 8/14/2006 | 0.0-0.2 | in-channel | 2.5Y 3/2 very dark grayish br very fine sand, wet, subangular blocky, moist, loose, Non-plastic, non-cohesive, trace medium sand, section of tree trunk | 1 | SM | 45.3 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RA-9+50-IC-C | 8/14/2006 | 0.2-0.5 | in-channel | 10YR 4/1 dark gray coarse sand, wet, moist, loose, Non-plastic, medium to coarse sand, fining upward, non-cohesive, trace gravel, subrounded to subangular | 2 | -- | 13.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RA-9+50-IC-NE | 8/14/2006 | 0.0-0.1 | in-channel | 10YR 4/2 dark grayish brown and 10YR 2/1 black , wet, moist, friable, slightly plastic, very fine sandy silt, cohesive, 2% organic matter | 1 | -- | 48.3 | <4 | 9 | <4 | <4 | 9 | <20 [*] | <10 [*] | Dow |
| RA-9+50-IC-NE | 8/14/2006 | 0.1-1.0 | in-channel | 10YR 5/3 brown sand, wet, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded sand grains, well-sorted, few shell fragments | 2 | -- | 14.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

"LISR" indicates elevated reporting limit due to low internal standard recovery.

"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.



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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach A

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RA-9+50-IC-SW | 8/14/2006 | 0.0-1.4 | in-channel | 2.5Y 3/1 very dark gray very fine sand, wet, moist, friable, Non-plastic, silty very fine sand, noncohesive, 2% organic matter, distinct layer break with next layer, texture and color | 1 | -- | 28.9 | <4 | <4 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RA-9+50-IC-SW | 8/14/2006 | 1.4-2.3 | in-channel | 10YR 2/1 black and 10YR 4/1 dark gray fine sand, wet, moist, loose, Non-plastic, very fine and fine sand, noncohesive, 1% organic matter, trace coarse sand, trace shell fragments, somewhat well-sorted | 2 | -- | 41.2 | <4 | 21 | <4 | <4 | <4 | 21 * | <10 * | Dow |
| RA-9+50-IC-SW | 8/14/2006 | 2.3-2.6 | in-channel | 2.5Y 3/1 very dark gray, wet, moist, friable, slightly plastic, very fine sandy silt, cohesive, 5% organic matter, layer of fine sand | 3 | -- | 34.6 | <4 | 13 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RA-9+50-IC-SW | 8/14/2006 | 2.6-5.1 | in-channel | 10YR 4/2 dark grayish brown very fine sandy loam, wet, granular, moist, friable, Non-plastic, few fine roots, cohesive, fine granular structure | 3 | SM | 21.2 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-15+00-IC-C | 8/17/2006 | 0.0-0.2 Lab Duplicate | in-channel | 10YR 2/2 very dark brown and 10YR 4/2 dark grayish brown silt loam, wet, subangular blocky, moist, friable, slightly plastic, few fine roots, cohesive | 1 | ML | 45.7 | <4 | 7 | <4 | 4 | <14 | <30 * | <10 * | Dow |
| RB-15+00-IC-C | 8/17/2006 | 0.0-0.2 | in-channel | 10YR 2/2 very dark brown and 10YR 4/2 dark grayish brown silt loam, wet, subangular blocky, moist, friable, slightly plastic, few fine roots, cohesive | 1 | ML | 44.9 | <4 | 8 | 6 | 6 | 6 | 26* | <10 * | Dow |
| RB-15+00-IC-C | 8/17/2006 | 0.2-1.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, very well sorted, subrounded grains | 2 | SP | 5.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-15+00-IC-C | 8/17/2006 | 1.4-1.7 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, very fine to medium sand, noncohesive, somewhat well sorted, trace coarse sand, subrounded grains | 3 | SP | 13.1 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-15+00-IC-C | 8/17/2006 | 1.7-1.9 | in-channel | 10YR 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, fine sand with coarse sand and fine gravel, noncohesive, somewhat poorly sorted, subrounded to subangular grains | 4 | -- | 8.6 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 0.0-0.1 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, very well sorted, no organics | 1 | -- | 10.9 | <4 | <9 LISR | <4 | <5 | <9 | <31 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 0.1-0.6 | in-channel | 10YR 2/1 black and N 2/0 black fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, noncohesive, very well sorted | 2 | -- | 16.7 | <4 | <7 LISR | <4 | <4 | <7 | <26 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 0.6-0.9 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, very well sorted Lab Duplicate | 3 | -- | 17.9 | <4 | <7 LISR | <4 | <4 | <4 | <23 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 0.6-0.9 Lab Duplicate | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, very well sorted Lab Duplicate | 3 | -- | 18.7 | <4 | <6 LISR | <4 | <4 | <4 | <22 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 0.9-1.1 | in-channel | 10YR 2/1 black and 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, very fine and fine sand, noncohesive, well sorted | 4 | -- | 22.4 | <4 | <4 | <4 | <4 | <9 | <25 | <10 | Dow |
| RB-15+00-IC-NE | 8/16/2006 | 1.1-1.3 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, common very fine roots, very fine and fine sand, noncohesive, well sorted, very fine and fine sand | 5 | -- | 27.4 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-15+00-IC-SW | 8/17/2006 | 0.0-0.5 | in-channel | 2.5Y 3/1 very dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, silty very fine sand, noncohesive, somewhat poorly sorted | 1 | SW | 50.5 | <4 | 10 | 4 | 7 | 10 | 31* | <10* | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 0.5-1.0 | in-channel | 2.5Y 4/1 dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, noncohesive, very fine and fine roots, somewhat poorly sorted | 2 | SP | 31.2 | <4 | 16 | 10 | 9 | 10 | 44* | <10* | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 1.0-2.0 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, trace medium sand, very well sorted Field Duplicate | 3 | SP | 18.2 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 1.0-2.0 Field Duplicate | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, trace medium sand, very well sorted Field Duplicate | 3 | SP | 17.1 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 2.0-2.7 | in-channel | 10YR 2/1 black, wet, single grain, moist, loose, Non-plastic, many very fine roots, silty very fine sand, noncohesive, trace medium and coarse sand, very fine and fine roots, somewhat poorly sorted | 4 | SW | 44.1 | 21 | 13 | 6 | 16 | 25 | 81 | 33 | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 2.7-3.1 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, few medium and coarse sand, somewhat well sorted | 5 | SP | 18.5 | <4 | <4 | 5 | <4 | 7 | <20* | <10* | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 3.1-3.2 | in-channel | 10YR 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, trace shell fragments, somewhat well sorted | 6 | SP | 11 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 3.2-3.4 | in-channel | 10YR 3/1 very dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, silty very fine sand, noncohesive, includes portions of tree branches, somewhat poorly sorted | 7 | SW | 64.9 | <4 | <4 | <5 | <5 | <12 | <30 | <10 | Dow |
| RB-15+00-IC-SW | 8/17/2006 | 3.4-3.5 | in-channel | 10YR 5/1 gray fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive, trace coarse sand | 8 | SP | 18 | <4 | 6 | <4 | <4 | <5 | <20* | <10* | Dow |
| RB-22+00-IC-C | 8/17/2006 | 0.0-0.1 | in-channel | 10YR 3/1 very dark gray silt loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive | 1 | ML | 39.4 | <4 | 9 | 6 | 14 | 12 | 41* | <10* | Dow |
| RB-22+00-IC-C | 8/17/2006 | 0.1-0.3 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common medium sand, trace coarse sand, somewhat poorly sorted Lab Duplicate | 2 | SW | 6.3 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-22+00-IC-C | 8/17/2006 | 0.1-0.3 Lab Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common medium sand, trace coarse sand, somewhat poorly sorted Lab Duplicate | 2 | SW | 6.6 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-22+00-IC-C | 8/17/2006 | 0.3-0.7 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, somewhat poorly sorted | 3 | SW | 7.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-22+00-IC-C | 8/17/2006 | 0.7-1.7 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, few fine gravel, somewhat poorly sorted | 4 | SW | 9.6 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-22+00-IC-NE | 8/17/2006 | 0.0-0.1 | in-channel | 10YR 3/2 very dark grayish br silt loam, wet, subangular blocky, moist, friable, slightly plastic, cohesive | 1 | ML | 43.1 | <4 | <4 | <4 | <6 | <12 | <30 | <10 | Dow |
| RB-22+00-IC-NE | 8/17/2006 | 0.1-0.3 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, somewhat poorly sorted, trace shell fragments | 2 | SW | 20.2 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-22+00-IC-NE | 8/17/2006 | 0.3-0.9 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, poorly sorted, common shell fragments, few fine gravel | 3 | SW | 11.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 0.0-0.7 | in-channel | 10YR 2/1 black and 10YR 3/1 very dark gray , wet, single grain, moist, loose, Non-plastic, common very fine roots, silty very fine sand, non-cohesive, subrounded grains, very fine and fine roots, somewhat poorly sorted | 1 | SW | 47.4 | <4 | <4 | <4 | <5 | <10 | <27 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 0.7-1.2 | in-channel | 2.5Y 4/1 dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, non-cohesive, subrounded grains, very fine and fine roots | 2 | SW | 38.4 | <4 | <7 | <6 | <8 | <14 | <38 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 1.2-1.3 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium and coarse sands | 3 | SW | 23.7 | <4 | <4 | <5 | <7 | <13 | <33 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 1.3-1.9 | in-channel | 10YR 2/1 black and 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, non-cohesive, subrounded grains, few medium and coarse sand, very fin and fine roots | 4 | SW | 28.1 | <4 | <4 | <4 | <4 | <6 | <21 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 1.9-2.1 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, subangular few coarse sand, somewhat well sorted | 5 | SP | 20.4 | <4 | 10 | 7 | 6 | 5 | 29* | <10 * | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 2.1-2.5 | in-channel | 2.5Y 4/1 dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace coarse sand, well sorted | 6 | SP | 26.2 | <4 | <4 | <4 | 7 | 26 | 33* | <10 * | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 2.5-3.0 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace medium and coarse sand | 7 | SP | 14 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-22+00-IC-SW | 8/17/2006 | 3.0-3.3 | in-channel | 10YR 5/1 gray sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, few coarse sand | 8 | SP | 16.4 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-29+50-T-SW180 | 8/20/2006 | 0.0-0.2 | tributary | 10YR 2/1 black and 10YR 3/3 dark brown sandy loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive | C1 | SM | 43.5 | <4 | 9 | 4 | 4 | 14 | 31* | <10* | Alta |
| RB-29+50-T-SW180 | 8/20/2006 | 0.2-0.6 | tributary | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive | 2C2 | SM | 34.3 | 5 | 11 | <5 | 6 | 22 | 43* | <10* | Alta |
| RB-29+50-T-SW180 | 8/20/2006 | 0.6-1.4 | tributary | 10YR 3/1 very dark gray and 10YR 5/1 gray sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, fine and medium sand, non-cohesive, subrounded grains, somewhat well sorted | 2C3 | SP | 21.7 | 11 | 14 | 5 | 6 | 19 | 55 | 18 | Alta |
| RB-29+50-T-SW180 | 8/20/2006 | 1.4-1.6 | tributary | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded sand grains, angular black glasslike grains, somewhat well-sorted | 2C4 | SP | 9.7 | 4 | 5 | <4 | <4 | 7 | <20* | <10* | Alta |
| RB-30+50-IC-C | 8/18/2006 | 0.0-0.1 | in-channel | 10YR 3/3 dark brown and 10YR 3/2 very dark grayish br silt loam, wet, subangular blocky, moist, friable, slightly plastic, cohesive | 1 | ML | 44.4 | <4 | 18 | 35 | 32 | 20 | 100 | 18 | Dow |
| RB-30+50-IC-C | 8/18/2006 | 0.1-0.5 | in-channel | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, fine and medium sand, non-cohesive, lense of silty sand (10YR 3/2) subrounded grains, somewhat poorly sorted | 2 | SW | 8.5 | <4 | 4 | <4 | <4 | 11 | <20* | <10* | Dow |
| RB-30+50-IC-C | 8/18/2006 | 0.5-1.7 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, common fine and coarse sand, subrounded grains, somewhat poorly sorted | 3 | SW | 6.4 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RB-30+50-IC-C | 8/18/2006 | 1.7-1.9 | in-channel | 10YR 2/1 black silt loam, wet, subangular blocky, moist, friable, slightly plastic, cohesive | 4 | ML | 35.1 | 10 | 30 | 47 | 70 | 97 | 250 | 49 | Dow |
| RB-30+50-IC-C | 8/18/2006 | 1.9-2.0 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grain, somewhat well sorted | 5 | SP | 16.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-30+50-IC-NE | 8/18/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, fine and medium sand, non-cohesive, subrounded grains, fine to medium roots, trace coarse sand, few shell fragments, somewhat well sorted | 1 | SP | 14.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-30+50-IC-NE | 8/18/2006 | 0.3-1.1 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, trace fine sand, few fine gravel, common shell fragments, somewhat poorly sorted | 2 | SW | 10.8 | <4 | <5 LISR | <4 | <4 | <8 LISR | <25 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-30+50-IC-SW | 8/22/2006 | 0.0-0.2 | in-channel | 5Y 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive | 1 | SM | 41.6 | <4 | 6 | <4 | <4 | 7 | <20 * | <10 * | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 0.2-0.7 | in-channel | N 2/0 black and 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive | 2 | SM | 24.5 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 0.7-1.0 | in-channel | 2.5Y 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive | 3 | SM | 32.3 | 8 | 39 | 15 | 17 | 26 | 100 | 22 | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 1.0-1.4 | in-channel | 10YR 4/1 dark gray and 10YR 3/1 very dark gray very fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive, very fine and fine roots | 4 | SM | 24.3 | <4 | 7 | 5 | 8 | 8 | 28* | <10 * | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 1.4-1.6 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic | 5 | SP | 18 | <4 | 23 | 7 | 12 | 8 | 50* | <10 * | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 1.6-2.5 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common fine roots, non-cohesive, very fine, fine, and medium roots | 6 | SM | 23.2 | 5 | 27 | 15 | 23 | 50 | 120 | 22 | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 2.5-3.2 | in-channel | 10YR 4/1 dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, fine layering pattern, well sorted | 7 | SP | 18.8 | <4 | 15 | 11 | 10 | 8 | 44* | <10 * | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 3.2-3.6 | in-channel | N 2/0 black and 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, many very fine roots, non-cohesive, very fine and fine roots, distinct organic matter layer | 8 | SM | 27.8 | <4 | 29 | 23 | 17 | 31 | 100 | 14 | Dow |
| RB-30+50-IC-SW | 8/22/2006 | 3.6-4.0 | in-channel | 5Y 2/1 black and 2.5Y 3/1 very dark gray silt loam, wet, moist, friable, slightly plastic, very few very fine roots, cohesive, distinct very fine sand layer | 9 | ML | 45.3 | 11 | 42 | 38 | 36 | 69 | 200 | 37 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-30+50-SW5 | 8/19/2006 | 0.0-1.0 | floodplain | 10YR 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots, cohesive | A | SM | 20.6 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 1.0-2.1 | floodplain | 10YR 3/1 very dark gray very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots, cohesive, two thin 10YR 5/2 grayish brown, fine sand layers | Bw | SM | 23.2 | <4 | 9 | <4 | <4 | 10 | <20 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 2.1-2.7 | floodplain | 10YR 3/2 very dark grayish br very fine sandy loam, dry, subangular blocky, dry, slightly hard, moderately plastic, few very fine roots, cohesive | Bt | SM | 19.9 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 2.7-3.1 | floodplain | 10YR 3/2 very dark grayish br silt loam, few 7.5YR 3/3 dark brown mottle, moist, angular blocky, moist, friable, moderately plastic, cohesive, few thin clay skins on ped faces | Bt2 | ML | 33.2 | <4 | 9 | <4 | 4 | 11 | 24* | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 3.1-3.9 | floodplain | 10YR 4/1 dark gray and 10YR 2/1 black very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, cohesive | C1 | SM | 26.8 | <4 | 5 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 3.9-4.2 | floodplain | 10YR 2/1 black very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive, organic matter from 3.9-4.0' | 2Ab | SM | 31 | <4 | 4 | <6 | <4 | 6 | <22 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 4.2-4.9 | floodplain | 10YR 4/1 dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive, poorly sorted | 2C2 | SW | 30.6 | <4 | 5 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RB-30+50-SW5 | 8/19/2006 | 4.9-5.2 | floodplain | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common very fine roots, non-cohesive, poorly sorted | 2C3 | SW | 40.3 | <6 ^{MI} | <9 ^{MI} | <9 ^{MI} | <10 ^{MI} | <9 ^{MI} | <44 | <10 | Alta |
| RB-30+50-SW85 | 8/20/2006 | 0.0-0.4 | low terrace | 10YR 2/1 black loamy very fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots, non-cohesive, very fine and fine roots Lab Duplicate | A1 | SM | 3.3 | 11 | 25 | 16 | 21 | 54 | 130 | 28 | Dow |
| RB-30+50-SW85 | 8/20/2006 | 0.0-0.4 Lab Duplicate | low terrace | 10YR 2/1 black loamy very fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots, non-cohesive, very fine and fine roots Lab Duplicate | A1 | SM | 3 | 11 | 35 | 19 | 26 | 53 | 140 | 30 | Dow |
| RB-30+50-SW85 | 8/20/2006 | 0.4-1.6 | low terrace | 10YR 3/1 very dark gray very fine sand, dry, single grain, dry, loose, Non-plastic, few very fine roots, non-cohesive | Bw | SP | 3.1 | 30 | 37 | 16 | 22 | 57 | 160 | 51 | Alta |
| RB-30+50-SW85 | 8/20/2006 | 1.6-2.5 | low terrace | 10YR 2/1 black very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, cohesive | Bt | SM | 7.4 | <4 | 11 | 5 | <4 | 10 | 26* | <10 * | Alta |
| RB-30+50-SW85 | 8/20/2006 | 2.5-3.1 | low terrace | 7.5YR 3/3 dark brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, non-cohesive | C1 | SM | 9.5 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RB-30+50-SW85 | 8/20/2006 | 3.1-3.9 | low terrace | 7.5YR 3/4 dark brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots, cohesive | 2C2 | SM | 9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-30+50-SW905 | 9/19/2006 | 0.0-0.2 | wetland | 10YR 3/2 very dark grayish br silt loam, <15% gravel, moist, granular, moist, very friable, slightly plastic, many very fine roots, very fine and fine roots, medium gravel | A | ML | 25.4 | 23 | 27 | 22 | 20 | 91 | 180 | 46 | Alta |
| RB-30+50-SW905 | 9/19/2006 | 0.2-0.4 | wetland | 10YR 4/3 brown silty clay loam, common 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, granular, moist, friable, slightly plastic, many very fine roots, granular to subangular blocky, slightly to moderately plastic, very fine, fine and medium roots, medium gravel | Bw | CL | 22.3 | 39 | 31 | 13 | 19 | 60 | 160 | 60 | Alta |
| RB-30+50-SW905 | 9/19/2006 | 0.4-1.1 | wetland | 10YR 3/2 very dark grayish br silt loam, common 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, friable, slightly plastic, very few fine roots | C1 | ML | 38.2 | 120 | 87 | 61 | 66 | 240 | 570 | 190 | Alta |
| RB-30+50-SW905 | 9/19/2006 | 1.1-2.2 | wetland | 2.5Y 4/1 dark gray silt loam, common 5YR 4/6 yellowish red mottle, moist, massive, moist, friable, moderately plastic, other odor, medium prominent mottles, small charcoal pieces | C2 | ML/CL | 28.1 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RB-30+50-SW905 | 9/19/2006 | 2.2-2.5 | wetland | 5Y 5/3 olive silt loam, moist, massive, moist, friable, slightly plastic, slightly to moderately plastic, small area of reduced gray matrix | Cg3 | ML | 21.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RB-30+50-SW905 | 9/19/2006 | 2.5-3.5 | wetland | N 4/0 dark gray very fine sandy loam, wet, subangular blocky, moist, very friable, slightly plastic, Decaying wood at 2.7-2.8' and 3.5' | 2Cg4 | SM | 30.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RB-32+00-SW1000 | 11/3/2006 | 0.0-1.8 | wetland | 10YR 3/2 very dark grayish br loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 17 | 12 | 18 | 17 | 17 | 28 | 91 | 24 | Dow |
| RB-32+00-SW1000 | 11/3/2006 | 0.0-1.8 Lab Duplicate | wetland | 10YR 3/2 very dark grayish br loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 16.4 | 10 | 21 | 17 | 17 | 27 | 92 | 23 | Dow |
| RB-32+00-SW1000 | 11/3/2006 | 1.8-3.0 | wetland | 10YR 5/6 yellowish brown loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 14.4 | <4 | <8 LISR | <7 LISR | <6 LISR | <4 | <29 | <10 | Dow |
| RB-32+00-SW1000 | 11/3/2006 | 3.0-3.3 | wetland | 10YR 4/4 dark yellowish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, trace white freshwater shells | C2 | SP | 16.1 | <4 | <6 LISR | <5 LISR | <5 LISR | <10 LISR | <30 | <10 | Dow |
| RB-36+00-IC-C | 8/21/2006 | 0.0-2.1 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, few coarse sand, subrounded grains, somewhat well sorted Field Duplicate | 1 | SP | 3.3 | <4 | <4 | <4 | <4 | <7 | <23 * | <10 * | Dow |
| RB-36+00-IC-C | 8/21/2006 | 0.0-2.1 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, few coarse sand, subrounded grains, somewhat well sorted Field Duplicate | 1 | SP | 3.9 | <4 | <4 | <4 | <4 | <5 | <21 * | <10 * | Dow |
| RB-36+00-IC-C | 8/21/2006 | 2.1-2.5 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, somewhat well sorted | 2 | SP | 14.5 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RB-36+00-IC-C | 8/21/2006 | 2.5-2.8 | in-channel | 10YR 4/1 dark gray very fine sand, wet, single grain, moist, loose, Non-plastic, few medium roots, non-cohesive, subrounded grains, well sorted, organic material | 3 | SP | 18.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-36+00-IC-NE | 8/21/2006 | 0.0-0.8 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded/ subangular grains. common shell fragments, somewhat well sorted | 1 | SP | 12.8 | <4 | 31 | 85 | 24 | 330 | 470 | 52 | Dow |
| RB-36+00-IC-NE | 8/21/2006 | 0.8-1.1 | in-channel | 10YR 4/2 dark grayish brown coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, common fine and medium gravel, somewhat well sorted | 2 | SP | 6.3 | <4 | <4 | <4 | <4 | 12 | <20 * | <10 * | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 0.0-0.2 | in-channel | 5Y 3/2 dark olive gray very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, trace coarse sand, well sorted | 1 | SP | 35.5 | <4 | <4 | <4 | <5 | <4 | <21 | <10 | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 0.2-0.7 | in-channel | 2.5Y 3/2 very dark grayish br fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, well sorted | 2 | SP | 20.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 0.7-1.4 | in-channel | N 2/0 black and 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, organic matter layers, somewhat poorly sorted Lab Duplicate | 3 | SW | 28.1 | <4 | <5 ^{LISR} | <5 ^{LISR} | <6 ^{LISR} | <9 ^{LISR} | <29 * | <10 * | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 0.7-1.4 Lab Duplicate | in-channel | N 2/0 black and 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, organic matter layers, somewhat poorly sorted Lab Duplicate | 3 | SW | 27.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 1.4-2.8 | in-channel | 10YR 4/4 dark yellowish brown loamy very fine sand, few 7.5YR 3/4 dark brown mottle, wet, single grain, moist, loose, Non-plastic, non-cohesive, oxidized layers, somewhat poorly sorted | 4 | SW | 16.8 | <4 | <4 | <6 ^{LISR} | <6 ^{LISR} | <16 ^{LISR} | <37 * | <10 * | Dow |
| RB-36+00-IC-SW | 8/21/2006 | 2.8-2.9 | in-channel | 2.5Y 4/1 dark gray sandy clay loam, few 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, moist, firm, very plastic, cohesive | 5 | CL | 16.2 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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Upper Tittabawassee River: Reach B

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RB-36+00-SW30 | 8/20/2006 | 0.0-0.5 | low terrace | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots, non-cohesive, very fine and fine roots | A | SM | 2.1 | 14 | 53 | 36 | 44 | 81 | 230 | 46 | Alta |
| RB-36+00-SW30 | 8/20/2006 | 0.5-1.2 | low terrace | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, non-cohesive, trace medium and coarse sand | C1 | SM | 2.6 | 5 | 49 | 28 | 23 | 53 | 160 | 25 | Alta |
| RB-36+00-SW30 | 8/20/2006 | 1.2-3.0 | low terrace | 10YR 3/1 very dark gray and 10YR 4/4 dark yellowish brown very fine sand, dry, single grain, dry, loose, Non-plastic, non-cohesive, well sorted, 2 layers very fine sand (10YR 4/4) | 2C2 | SP | 3.2 | <4 | 160 | 97 | 67 | 110 | 440 | 58 | Alta |
| RB-36+00-SW30 | 10/21/2006 | 3.0-3.6 Lab Duplicate | low terrace | 10YR 3/1 very dark gray very fine sand, moist, single grain, moist, loose, Non-plastic | 2C2 | SP | 11.5 | <4 | 68 | 26 | 28 | 30 | 150 | 23 | Dow |
| RB-36+00-SW30 | 10/21/2006 | 3.0-3.6 | low terrace | 10YR 3/1 very dark gray very fine sand, moist, single grain, moist, loose, Non-plastic | 2C2 | SP | 11.9 | <4 | 17 | 13 | 12 | 21 | 62 | 11 | Dow |
| RB-36+00-SW30 | 10/21/2006 | 3.6-5.2 | low terrace | 7.5YR 4/3 brown very fine sandy loam, moist, granular, moist, friable, slightly plastic | 3C | SM | 12.3 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RB-36+00-SW30 | 10/21/2006 | 5.2-6.3 | low terrace | 7.5YR 4/3 brown very fine sandy loam, moist, granular, moist, friable, slightly plastic | 3C | SM | 17 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RB-37+00-SW60 | 11/3/2006 | 0.0-1.7 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | AC | SM | 13.8 | 39 | 54 | 32 | 44 | 74 | 240 | 72 | Dow |
| RB-37+00-SW60 | 11/3/2006 | 1.7-2.4 | low terrace | 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 10.6 | 5 | 4 | <4 | 4 | 7 | 21 * | <10 * | Dow |
| RB-37+00-SW60 | 11/3/2006 | 2.4-3.1 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | Ab | SM | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RB-37+00-SW60 | 11/3/2006 | 3.1-3.3 | low terrace | 10YR 3/4 dark yellowish brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, BURIED B HORIZON WITH CLAY ACCUMULATION | Bb | ML/CL | 18.9 | <4 | <6 LISR | <6 LISR | <6 LISR | <11 LISR | <33 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

"LISR" indicates elevated reporting limit due to low internal standard recovery.

"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.



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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach C

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RC-38+50-IC-C | 8/22/2006 | 0.0-0.2 | in-channel | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, slightly plastic, very few very fine roots, friable, cohesive | 1 | SM | 29.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-38+50-IC-C | 8/22/2006 | 0.2-2.2 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, Non-plastic, loose, non-cohesive, subrounded grains, few medium sand | 2 | SP | 4.4 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RC-38+50-IC-C | 8/22/2006 | 2.2-2.7 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, Non-plastic, loose, non-cohesive, subrounded grains, well sorted, few fine sand | 3 | SP | 11.6 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |
| RC-38+50-IC-C | 8/22/2006 | 2.7-3.2 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, Non-plastic, loose, well sorted, non-cohesive | 4 | SP | 16.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-38+50-IC-NE | 8/22/2006 | 0.0-0.8 | in-channel | 10YR 3/1 very dark gray coarse sand, wet, single grain, Non-plastic, loose, non-cohesive, common shell fragments, somewhat well sorted, subrounded grains | 1 | SP | 6.8 | <4 | <4 | <4 | <4 | <9 ^{LSUR} | <25 | <10 | Dow |
| RC-38+50-IC-NE | 8/22/2006 | 0.8-1.2 | in-channel | 10YR 3/1 very dark gray coarse sand, wet, single grain, Non-plastic, loose, non-cohesive, subrounded and subangular grains, well sorted | 2 | SP | 8.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RC-38+50-IC-SW | 8/22/2006 | 0.0-0.8 | in-channel | N 2/0 black and 10YR 3/1 very dark gray very fine sand, wet, single grain, Non-plastic, common very fine roots, loose, subrounded grains, well sorted, non cohesive | 1 | SP | 20.2 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |
| RC-38+50-IC-SW | 8/22/2006 | 0.8-1.3 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, single grain, Non-plastic, very few fine roots, loose, non-cohesive, subrounded grains | 2 | SM | 21 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-38+50-IC-SW | 8/22/2006 | 1.3-1.7 | in-channel | 10YR 2/1 black and 2.5Y 4/1 dark gray loamy very fine sand, wet, single grain, Non-plastic, common very fine roots, loose, non-cohesive, distinct silt layers, subrounded grains | 3 | SM | 34.6 | <4 | 9 | 5 | 5 | 11 | 29* | <10 [*] | Dow |
| RC-38+50-IC-SW | 8/22/2006 | 1.7-2.8 | in-channel | 10YR 4/1 dark gray and 10YR 4/2 dark grayish brown very fine sandy loam, wet, subangular blocky, slightly plastic, very few very fine roots, friable, cohesive | 4 | SM | 17.8 | <4 | 4 | <4 | <4 | 4 | <20 [*] | <10 [*] | Dow |
| RC-38+50-IC-SW | 8/22/2006 | 2.8-3.2 | in-channel | 10YR 5/2 grayish brown loamy very fine sand, common 5YR 4/4 reddish brown mottle, wet, single grain, Non-plastic, loose, non-cohesive | 5 | SM | 17.6 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RC-38+50-SW30 | 8/20/2006 | 0.0-0.4 | floodplain | 10YR 4/2 dark grayish brown loamy very fine sand, dry, single grain, Non-plastic, common very fine roots, Non-Cohesive, Loose | 1C | SM | 9.1 | <4 | 6 | <4 | <4 | 5 | <20 [*] | <10 [*] | Alta |
| RC-38+50-SW30 | 8/20/2006 | 0.4-1.2 | floodplain | 10YR 3/1 very dark gray very fine sandy loam, moist, granular, slightly plastic, few very fine roots, Cohesive, Friable | 2A | SM | 23.5 | <4 | 7 | <4 | <4 | 6 | <20 [*] | <10 [*] | Alta |
| RC-38+50-SW30 | 8/20/2006 | 1.2-2.2 | floodplain | 10YR 3/2 very dark grayish br sandy loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, slightly plastic, Friable, Cohesive | 2Bt | SM | 22.8 | <4 | 6 | <4 | <4 | 7 | <20 [*] | <10 [*] | Alta |
| RC-38+50-SW30 | 8/20/2006 | 2.2-3.3 | floodplain | 7.5YR 4/4 brown very fine sand, few 10YR 4/4 dark yellowish brown mottle, wet, single grain, Non-plastic, loose, non-cohesive, well-sorted | 2C | SP | 21.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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"LSV" indicates elevated reporting limit due to limited sample volume.

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"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach C

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RC-38+50-SW60 | 8/20/2006 | 0.0-0.4 | low terrace | 10YR 2/2 very dark brown loamy very fine sand, dry, single grain, Non-plastic, many fine roots, non-cohesive, loose | 2A | SM | 4 | 21 | 77 | 37 | 38 | 81 | 250 | 54 | Alta |
| RC-38+50-SW60 | 8/20/2006 | 0.4-0.9 | low terrace | 10YR 4/2 dark grayish brown very fine sand, dry, single grain, Non-plastic, Cohesive, well sorted, loose | 2E | SP | 3.1 | 42 | 67 | 26 | 37 | 98 | 270 | 77 | Alta |
| RC-38+50-SW60 | 8/20/2006 | 0.9-1.5 | low terrace | 10YR 3/1 very dark gray loamy very fine sand, dry, single grain, Non-plastic, loose, non-cohesive | 2Bw | SM | 4.6 | 66 | 180 | 91 | 84 | 170 | 590 | 140 | Alta |
| RC-38+50-SW60 | 8/20/2006 | 1.5-2.0 | low terrace | 7.5YR 3/4 dark brown very fine sand, dry, single grain, Non-plastic, loose, non-cohesive | 2C | SP | 3.2 | <4 | 4 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RC-45+00-IC-C | 8/22/2006 | 0.0-1.8 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, Non-plastic, non-cohesive, subrounded grains, few medium sand, well sorted | 1 | SP | 2.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RC-45+00-IC-C | 8/22/2006 | 1.8-2.4 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, Non-plastic, Loose, non-cohesive, subrounded grains, trace coarse sand, somewhat well sorted | 2 | SP | 5.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-C | 8/22/2006 | 2.4-3.1 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, Non-plastic | 3 | SP | 14.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-NE | 8/22/2006 | 0.0-1.6 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, Non-plastic, loose, non-cohesive, subrounded grains, well sorted | 1 | SP | 2.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-NE | 8/22/2006 | 0.0-1.6 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, Non-plastic, loose, non-cohesive, subrounded grains, well sorted | 1 | SP | 3.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-NE | 8/22/2006 | 1.6-2.0 | in-channel | 10YR 4/2 dark grayish brown very fine sand, single grain, Non-plastic, loose, non-cohesive, subround grains, few medium and coarse sands, somewhat well sorted. | 2 | SP | 9 | <4 | <4 | <4 | <5 LISR | <4 | <21 | <10 | Dow |
| RC-45+00-IC-NE | 8/22/2006 | 2.0-2.6 | in-channel | 10YR 4/1 dark gray very fine sand, wet, single grain, Non-plastic, loose, non-cohesive, subround grains, well sorted | 3 | SP | 16 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach C

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RC-45+00-IC-SW | 8/22/2006 | 0.0-0.1 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, Non-plastic, very few very fine roots, loose, non-cohesive | 1 | SM | 25.8 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Dow |
| RC-45+00-IC-SW | 8/22/2006 | 0.1-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, Non-plastic, fine and medium sand, loose, non-cohesive, trace coarse sand, somewhat poorly sorted | 2 | SW | 16.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-SW | 8/22/2006 | 0.6-1.1 | in-channel | 10YR 5/2 grayish brown sandy loam, common 10YR 4/6 dark yellowish brown mottle, wet, granular, Non-plastic, very few very fine roots, friable, cohesive, | 3 | SW | 18 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-SW | 8/22/2006 | 1.1-1.9 | in-channel | 10YR 5/1 gray loamy fine sand, few 10YR 5/4 yellowish brown mottle, wet, granular, Non-plastic, very few very fine roots, friable, cohesive | 4 | SM | 21.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RC-45+00-IC-SW | 8/22/2006 | 1.9-3.4 | in-channel | 10YR 5/1 gray loamy fine sand, few 10YR 5/4 yellowish brown mottle, wet, single grain, Non-plastic, very few very fine roots, loose, non-cohesive, few shell fragments, few coarse sand, | 5 | SM | 19.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RC-45+00-IC-SW | 8/22/2006 | 3.4-3.7 | in-channel | 10YR 4/1 dark gray loamy very fine sand, wet, single grain, Non-plastic, loose, non-cohesive, few coarse sand, few shell fragments | 6 | SM | 19 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RC-45+00-SW20 | 8/20/2006 | 0.0-0.8 | low terrace | 10YR 2/2 very dark brown loamy very fine sand, dry, single grain, Non-plastic, common fine roots, Loose, non-cohesive | A | SM | 5.7 | 6 | 45 | 20 | 17 | 41 | 130 | 23 | Alta |
| RC-45+00-SW20 | 8/20/2006 | 0.8-1.7 | low terrace | 10YR 4/2 dark grayish brown clay loam, dry, angular blocky, very plastic, very few very fine roots, Very firm, cohesive, fill material, compacted. | Bt | CL | 10 | <4 | 17 | 11 | 15 | 36 | 80 | 14 | Dow |
| RC-45+00-SW20 | 8/20/2006 | 0.8-1.7 Lab Duplicate | low terrace | 10YR 4/2 dark grayish brown clay loam, dry, angular blocky, very plastic, very few very fine roots, Very firm, cohesive, fill material, compacted. | Bt | CL | 9.9 | <4 | 12 | 6 | 7 | 19 | 46* | <10 * | Dow |
| RC-45+00-SW20 | 8/20/2006 | 1.7-2.1 | low terrace | 10YR 2/1 black loamy very fine sand, few 5YR 3/3 dark reddish brown mottle, dry, moderately plastic, firm, fill material, compacted | C | SM | 12.8 | 64 | 120 | 61 | 57 | 270 | 570 | 130 | Alta |
| RC-45+00-SW20 | 10/21/2006 | 2.1-3.3 | low terrace | 10YR 2/1 black silty clay loam, moist, subangular blocky, moist, firm, moderately plastic, common very fine roots | 2C | CL | 25 | 12 | 100 | 65 | 110 | 220 | 500 | 86 | Dow |
| RC-45+00-SW20 | 10/21/2006 | 3.3-4.4 | low terrace | 10YR 4/3 brown silty clay loam, common 7.5YR 4/4 brown mottle, moist, subangular blocky, moist, firm, moderately plastic | 3C | CL | 22.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach C

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RC-45+00-SW65 | 8/20/2006 | 0.0-0.3 | low terrace | 10YR 2/1 black loamy very fine sand, dry, granular, slightly plastic, many very fine roots, Friable, cohesive, fine granular structure | A | SM | 15.3 | 11 | 37 | 17 | 16 | 58 | 140 | 28 | Alta |
| RC-45+00-SW65 | 8/20/2006 | 0.3-0.6 | low terrace | 10YR 3/2 very dark grayish br loamy very fine sand, few 10YR 4/4 dark yellowish brown mottle, dry, single grain, Non-plastic, very few very fine roots, loose, non-cohesive | B | SM | 12.2 | 10 | 23 | 11 | 11 | 39 | 94 | 22 | Alta |
| RC-45+00-SW65 | 8/20/2006 | 0.6-1.0 | low terrace | 10YR 3/3 dark brown sandy loam, few 7.5YR 3/4 dark brown mottle, moist, subangular blocky, moderately plastic, friable, cohesive, moderately subangular blocky structure | Bt | SM | 13.9 | 9 | 24 | 14 | 13 | 42 | 100 | 22 | Alta |
| RC-45+00-SW65 | 8/20/2006 | 1.0-1.2 | low terrace | 10YR 4/1 dark gray sandy clay loam, common 10YR 4/4 dark yellowish brown mottle, moist, angular blocky, very plastic, very few fine roots, firm, cohesive, 20% mottles | C | CL | 18.5 | 16 | 47 | 23 | 22 | 51 | 160 | 37 | Alta |
| RC-45+00-SW65 | 8/20/2006 | 1.2-1.6 | low terrace | 10YR 2/1 black loamy very fine sand, few 5YR 3/2 dark reddish brown mottle, moist, single grain, Non-plastic, loose, non-cohesive, trace fine sand | 2C | SM | 22.9 | 81 | 100 | 60 | 93 | 170 | 500 | 150 | Dow |
| RC-45+00-SW65 | 8/20/2006 | 1.6-2.4 | low terrace | 7.5YR 4/2 brown fine sand, wet, single grain, Non-plastic, loose, non-cohesive, trace fine sand | 2C2 | SW | 14.2 | 9 | 20 | 11 | 15 | 40 | 96 | 22 | Dow |
| RC-45+00-SW65 | 8/20/2006 | 2.4-3.4 | low terrace | 10YR 2/1 black sandy clay loam, moist, angular blocky, very plastic, firm, non-cohesive, medium angular blocky | 3C | CL | 25.3 | <4 | 63 | 44 | 54 | 150 | 310 | 46 | Dow |
| RC-45+00-SW65 | 8/20/2006 | 3.4-3.7 | low terrace | 5Y 4/2 olive gray silt loam, few 10YR 3/6 dark yellowish brown mottle, moist, angular blocky, moderately plastic, friable, cohesive | 4C | ML | 19.7 | <4 | 11 | 6 | 6 | 7 | 28* | <10* | Dow |
| RC-45+00-SW65 | 10/21/2006 | 3.7-4.8 | low terrace | 10YR 5/3 brown silty clay loam, common 5YR 3/3 dark reddish brown mottle, wet, subangular blocky, moist, firm, moderately plastic | 5C | CL | 22.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-48+00-IC-C | 9/7/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, very well sorted | 1 | SP | 2.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-48+00-IC-C | 9/7/2006 | 0.6-1.8 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, well sorted Field Duplicate | 2 | SP | 3.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-48+00-IC-C | 9/7/2006 | 0.6-1.8 Field Duplicate | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, well sorted Field Duplicate | 2 | SP | 3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-48+00-IC-C | 9/7/2006 | 1.8-2.5 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace medium, coarse sand, trace shell fragments, well sorted | 3 | SP | 13.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-48+00-IC-C | 9/7/2006 | 2.5-3.0 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, common fine sand, trace shell fragments, well sorted | 4 | SP | 16.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-48+00-IC-NE | 9/7/2006 | 0.0-0.2 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, well sorted | 1 | SP | 7.7 | <4 | <4 | <4 | <4 | 13 | <20 * | <10 * | Alta |
| RD-48+00-IC-NE | 9/7/2006 | 0.2-0.8 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, medium and coarse sand, non-cohesive, subrounded grains, somewhat well sorted, few shell fragments | 2 | SP | 9.1 | <4 | <4 | <4 | <4 | 9 | <20 * | <10 * | Alta |
| RD-48+00-IC-NE | 9/7/2006 | 0.8-1.2 | in-channel | 10YR 3/1 very dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded and subangular grains, few fine and medium gravel, few shell fragments | 3 | SP | 12.1 | <4 | <4 | <4 | <4 | 9 | <20 * | <10 * | Alta |
| RD-48+00-IC-SW | 9/7/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace coarse sand, trace shell fragments, well sorted | 1 | SP | 2.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RD-48+00-IC-SW | 9/7/2006 | 0.0-0.5 Lab Duplicate | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace coarse sand, trace shell fragments, well sorted | 1 | SP | 2.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RD-48+00-IC-SW | 9/7/2006 | 0.5-1.9 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, few medium sand, trace shell fragments, well sorted | 2 | SP | 3.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RD-48+00-IC-SW | 9/7/2006 | 1.9-2.9 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium sands, trace shell fragments, well sorted | 3 | SP | 17.5 | <4 | <4 | <4 | <4 | <10 ^{LISR} | <30 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-55+00-IC-CE | 9/7/2006 | 0.0-0.4 | in-channel | 10YR 3/2 very dark grayish br silt, moist, granular, moist, friable, slightly plastic, very few very fine roots, cohesive | 1 | ML | 48.8 | <4 | 8 | <6 | <6 | 14 | 22* | <10 [*] | Dow |
| RD-55+00-IC-CE | 9/7/2006 | 0.4-1.0 | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, trace medium sand, well sorted | 2 | SP | 2.7 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RD-55+00-IC-CE | 9/7/2006 | 1.0-2.2 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, few fine sand, few coarse sand, trace shell fragments, somewhat well sorted Field Duplicate | 3 | SP | 7.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RD-55+00-IC-CE | 9/7/2006 | 1.0-2.2 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, few fine sand, few coarse sand, trace shell fragments, somewhat well sorted Field Duplicate | 3 | SP | 6.6 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RD-55+00-IC-CE | 9/7/2006 | 2.2-2.6 | in-channel | 10YR 3/2 very dark grayish br sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded and subangular grains, few fine gravel, few shell fragments, somewhat well sorted | 4 | SP | 14 | <4 | 8 | 9 | 4 | 29 | 49* | <10 [*] | Dow |
| RD-55+00-IC-NE | 9/7/2006 | 0.0-0.4 | in-channel | 10YR 3/2 very dark grayish br silt, moist, granular, moist, friable, slightly plastic, very few very fine roots, cohesive | 1 | ML | 52.6 | <4 | 51 | 24 | 13 | 64 | 150 | 20 | Alta |
| RD-55+00-IC-NE | 9/7/2006 | 0.4-1.4 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, few coarse sand, few shell fragments, well sorted | 2 | SP | 4.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-55+00-IC-NE | 9/7/2006 | 1.4-2.1 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded and subangular grains, trace fine gravel, few shell fragments, somewhat well sorted | 3 | SP | 7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-55+00-IC-SW1 | 9/23/2006 | 0.0-1.9 Lab Duplicate | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, non-cohesive, subrounded grains, common medium sand, very fine and fine roots, very few shell fragments | 1 | SM | 20.5 | <4 | <4 | <5 | <5 | <11 | <29 | <10 | Dow |
| RD-55+00-IC-SW1 | 9/23/2006 | 0.0-1.9 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, non-cohesive, subrounded grains, common medium sand, very fine and fine roots, very few shell fragments | 1 | SM | 21 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |
| RD-55+00-IC-SW1 | 9/23/2006 | 1.9-2.8 | in-channel | 2.5Y 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive, subrounded grains, common medium sand, very fine and fine roots, very few shell fragments | 2 | SM | 23.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-55+00-IC-SW1 | 9/23/2006 | 2.8-4.0 Field Duplicate | in-channel | 10YR 2/1 black loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains, common medium sand, few shell fragments Field Duplicate | 3 | SM | 26.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-55+00-IC-SW1 | 9/23/2006 | 2.8-4.0 | in-channel | 10YR 2/1 black loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains, common medium sand, few shell fragments Field Duplicate | 3 | SM | 22.3 | <4 | <6 LISR | <4 | <4 | <7 | <25 | <10 | Dow |
| RD-55+00-IC-SW1 | 9/23/2006 | 4.0-7.9 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, granular, moist, friable, slightly plastic, very few fine roots, cohesive, subrounded grains, few medium sand | 4 | SM | 20.5 | <4 | <5 LISR | <7 | <6 | <4 | <26 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-55+00-IC-SW2 | 9/23/2006 | 0.0-2.1 | in-channel | 10YR 3/2 very dark grayish br loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common very fine roots, non-cohesive, subrounded grains, common medium sand, very fine to medium roots | 1 | SM | 36.4 | <4 | <5 | <5 | <5 | 6 | <23 * | <10 * | Dow |
| RD-55+00-IC-SW2 | 9/23/2006 | 2.1-2.3 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium sand | 2 | SM | 21.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 2.3-4.0 Field Duplicate | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common very fine roots, non-cohesive, subrounded grains, few medium sand, very fine and fine roots Field Duplicate | 3 | SM | 37.9 | <4 | 14 | 12 | 8 | 25 | 58 | <10 * | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 2.3-4.0 | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common very fine roots, non-cohesive, subrounded grains, few medium sand, very fine and fine roots Field Duplicate | 3 | SM | 38.7 | <4 | 9 | 5 | 5 | 19 | 38* | <10 * | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 4.0-5.9 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains, few medium sand, somewhat well sorted | 4 | SP | 17.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 5.9-7.8 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains, common medium sand | 5 | SM | 32.4 | <4 | 22 | 22 | 11 | 42 | 97 | 14 | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 7.8-8.2 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, common medium sand | 6 | SM | 18.6 | <4 | 6 | 4 | <4 | 18 | 28* | <10 * | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 8.2-10.4 | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium sand | 7 | SM | 25 | <4 | 11 | 10 | 8 | 41 | 71 | 11 | Dow |
| RD-55+00-IC-SW2 | 9/23/2006 | 10.4-10.7 | in-channel | 10YR 2/1 black , > or =90% gravel, wet, single grain, moist, loose, Non-plastic, Angular Gravel, non-cohesive | 8 | GP | 11 | 4 | 12 | 8 | 5 | 39 | 67 | 11 | Alta |
| RD-55+00-IC-SW2 | 9/23/2006 | 10.7-12.0 | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium sand | 9 | SM | 31.5 | 25 | 50 | 59 | 30 | 280 | 440 | 76 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-55+05-IC-NE | 10/31/2006 | 0.0-1.3 | in-channel | 10YR 2/1 black silt, wet, massive, moist, friable, slightly plastic, very few fine roots, petrochemical odor, very few fine gravel glossy sheen - not oily | 1 | ML | 42.6 | 100 | 56000 | 37000 | 24000 | 94000 | 210000 | 26000 | Alta |
| RD-55+05-IC-NE | 10/31/2006 | 0.0-1.3 Field Duplicate | in-channel | 10YR 2/1 black silt, wet, massive, moist, friable, slightly plastic, very few fine roots, petrochemical odor, very few fine gravel glossy sheen - not oily | 1 | ML | 46 | 69 | 47000 | 31000 | 19000 | 85000 | 180000 | 22000 | Alta |
| RD-55+05-IC-NE | 10/31/2006 | 1.3-2.2 Field Duplicate | in-channel | 10YR 8/6 yellow silt, wet, subangular blocky, moist, friable, slightly plastic, petrochemical odor, thixotropic very few fine gravel White material - paste like | 2 | ML | 57.6 | 41 | 5400 | 3200 | 1900 | 11000 | 22000 | 2600 | Alta |
| RD-55+05-IC-NE | 10/31/2006 | 1.3-2.2 | in-channel | 10YR 8/6 yellow silt, wet, subangular blocky, moist, friable, slightly plastic, petrochemical odor, thixotropic very few fine gravel White material - paste like | 2 | ML | 57.2 | 36 | 6400 | 4700 | 2700 | 16000 | 30000 | 3600 | Alta |
| RD-55+05-IC-NE | 10/31/2006 | 2.2-2.9 | in-channel | N 2/0 black and 10YR 7/8 yellow silt loam, wet, subangular blocky, moist, friable, slightly plastic, petrochemical odor, glossy distinct layering intermixing of above layer (whitish yellow material) | 3 | ML | 44.9 | 49 | 14000 | 9200 | 5300 | 36000 | 64000 | 7600 | Alta |
| RD-55+05-IC-NE | 10/31/2006 | 2.9-3.0 | in-channel | N 2/0 black silt, wet, subangular blocky, moist, friable, slightly plastic, petrochemical odor, glossy with really strong odor more of oily feel | 4 | ML | 41.5 | 54 | 13000 | 14000 | 7200 | 55000 | 89000 | 10000 | Alta |
| RD-55+10-IC-NE | 10/31/2006 | 0.0-0.9 | in-channel | N 2/0 black silt, wet, subangular blocky, moist, friable, slightly plastic, few fine roots, petrochemical odor, few fine gravel glossy sheen | 1 | ML | 43.2 | 100 | 39000 | 24000 | 16000 | 71000 | 150000 | 18000 | Alta |
| RD-55+10-IC-NE | 10/31/2006 | 0.9-1.3 | in-channel | N 2/0 black silt, wet, subangular blocky, moist, friable, slightly plastic, few medium roots, petrochemical odor, no oily sheen wood layer at 1.3 feet | 2 | ML | 41.7 | 63 | 49000 | 38000 | 24000 | 94000 | 200000 | 25000 | Alta |
| RD-55+10-IC-NE | 10/31/2006 | 1.3-1.9 | in-channel | N 2/0 black silt, wet, subangular blocky, moist, friable, slightly plastic, petrochemical odor, very few shell fragments oily sheen | 3 | ML | 49.1 | 130 | 71000 | 39000 | 30000 | 99000 | 240000 | 30000 | Alta |
| RD-55+10-IC-NE | 10/31/2006 | 1.9-2.5 | in-channel | N 2/0 black fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, petrochemical odor, very few fine gravel very few shell fragments slight oily sheen gravel layer at 2.5 feet | 4 | SM | 39.6 | 180 | 180000 | 110000 | 68000 | 210000 | 570000 | 69000 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach D

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RD-56+00-SW10 | 9/19/2006 | 0.0-0.8 | floodplain | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots | C1 | SP | 3.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW10 | 9/19/2006 | 0.8-1.6 | floodplain | 10YR 6/3 pale brown and 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, irregular laminations of secondary color and varying thickness | C2 | SP | 7.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW10 | 9/19/2006 | 1.6-2.0 | floodplain | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | C3 | SP | 2.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW10 | 9/19/2006 | 2.0-2.6 | floodplain | 10YR 6/3 pale brown and 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, few irregular laminations of secondary color, loamy fine sand | C4 | SP | 12 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW10 | 9/19/2006 | 2.6-3.6 | floodplain | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C5 | SP | 18.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW10 | 9/19/2006 | 3.6-4.4 | floodplain | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic | Cg6 | SP | 22.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW145 | 9/19/2006 | 0.0-1.0 | intermediate terrace | 10YR 6/3 pale brown fine sand, 15<35% gravel, dry, single grain, dry, loose, Non-plastic, very few very fine roots, Gravelly fine sand, SP and GP | -- | SP | 3.9 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RD-56+00-SW35 | 9/19/2006 | 0.0-1.0 | low terrace | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, Recent deposits thin layer of 10YR 4/3 brown loamy fine sand at 1.0' | -- | SP | 0.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RD-56+00-SW75 | 9/19/2006 | 0.0-1.0 | intermediate terrace | 10YR 6/3 pale brown fine sand, 15<35% gravel, dry, single grain, dry, loose, Non-plastic, few very fine roots, Gravelly fine sand, SP and GP | -- | SP | 4.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-59+50-SW35 | 9/19/2006 | 0.0-1.1 | floodplain | 10YR 6/3 pale brown and 10YR 4/3 brown fine sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, few fine roots, medium gravel, few thin buried root layers | -- | SP | 6.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-59+50-SW35 | 9/19/2006 | 1.1-1.4 | floodplain | 10YR 3/2 very dark grayish br loamy fine sand, dry, single grain, dry, loose, Non-plastic | -- | SP | 10.3 | 15 | 12 | 6 | 8 | 32 | 74 | 24 | Alta |
| RE-59+50-SW60 | 9/19/2006 | 0.0-1.5 | low terrace | 10YR 6/3 pale brown and 10YR 4/2 dark grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, common fine roots, Alternating layers 0.1' thickness, concentrated in dark grayish brown fine sand layers | -- | SP | 8.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-59+50-SW60 | 9/19/2006 | 1.5-2.5 | low terrace | 10YR 5/3 brown sandy loam, 35<60% gravel, dry, angular blocky, dry, moderately hard, slightly plastic, few medium roots, gravelly sandy loam | -- | SC | 4.5 | <4 | 26 | 16 | 10 | 51 | 110 | 16 | Alta |
| RE-59+50-SW90 | 9/19/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, dry, single grain, dry, loose, Non-plastic, many very fine roots, very fine and fine roots | A | SP | 12.3 | 9 | 12 | 6 | 7 | 21 | 55 | 16 | Alta |
| RE-59+50-SW90 | 9/19/2006 | 0.4-0.7 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, dry, subangular blocky, dry, soft, slightly plastic, very few very fine roots | Bw | SC | 7.2 | 11 | 11 | <4 | 6 | 14 | 42* | 17* | Alta |
| RE-59+50-SW90 | 9/19/2006 | 0.7-1.2 | intermediate terrace | 10YR 3/2 very dark grayish br very fine sand, dry, single grain, dry, loose, Non-plastic | 2Ab | SP | 8.8 | 23 | 16 | 7 | 9 | 28 | 83 | 33 | Alta |
| RE-59+50-SW90 | 9/19/2006 | 1.2-3.2 | intermediate terrace | 10YR 6/4 light yellowish brow very fine sand, dry, single grain, dry, loose, Non-plastic | 2C1 | SP | 1.1 | <4 | 4 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RE-59+50-SW90 | 9/19/2006 | 3.2-4.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | 2C2 | SC | 11.3 | 12 | 16 | 7 | 9 | 34 | 76 | 22 | Alta |
| RE-66+00-SW10 | 9/20/2006 | 0.0-0.8 | floodplain | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots, Alternating layers (approximately 0.1' in thickness). Roots primarily in darker layers. | -- | SP | 10.9 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RE-66+00-SW245 | 9/20/2006 | 0.0-0.7 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, few mottle, dry, granular, dry, soft, slightly plastic, many fine roots, few faint mottles in lower A | A | SC | 15.3 | 8 | 32 | 15 | 14 | 36 | 110 | 22 | Alta |
| RE-66+00-SW245 | 9/20/2006 | 0.7-1.1 | intermediate terrace | fine to coarse sand with fine and medium gravel (angular) and some clay | -- | -- | 9.8 | <4 | 1600 | 560 | 490 | 650 | 3300 | 430 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-66+00-SW40 | 9/20/2006 | 0.0-0.6 | low terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, common very fine roots, Upper 0.1' is recent 10YR 6/3 pale brown flood plain deposition | A | SP | 16.3 | <4 | 6 | <4 | <4 | 12 | <20 * | <10 * | Alta |
| RE-66+00-SW40 | 9/20/2006 | 0.6-1.7 | low terrace | 10YR 4/3 brown and 10YR 6/3 pale brown loamy fine sand, dry, subangular blocky, dry, soft, slightly plastic, Loamy fine sand with layers of fine sand. Subangular blocky to single grain, slightly plastic to non plastic, soft to loose. | C | SP | 7.3 | <4 | 7 | <4 | <4 | 10 | <20 * | <10 * | Alta |
| RE-66+00-SW40 | 9/20/2006 | 1.7-2.6 | low terrace | 10YR 4/3 brown sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, fill sand and gravel, SP | -- | -- | 4.4 | 17 | 3000 | 1200 | 930 | 1200 | 6300 | 820 | Alta |
| RE-66+00-SW40 | 9/20/2006 | 2.6-3.8 | low terrace | 10YR 6/3 pale brown clay, dry, massive, dry, very hard, very plastic, Compacted fill clay with gravel, some very gravelly fill sand below. | -- | -- | 10 | 5 | 190 | 83 | 67 | 110 | 450 | 63 | Alta |
| RE-66+00-SW430 | 9/20/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots, very fine and fine roots | A | SP | 9 | 11 | 83 | 43 | 46 | 200 | 380 | 60 | Alta |
| RE-66+00-SW430 | 9/20/2006 | 0.3-0.6 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C1 | SP | 6.2 | 120 | 2100 | 1700 | 920 | 5600 | 10000 | 1300 | Alta |
| RE-66+00-SW65 | 9/20/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, dry, granular, Non-plastic, many fine roots | A | SP | 14.2 | 8 | 110 | 54 | 63 | 260 | 500 | 73 | Alta |
| RE-66+00-SW65 | 9/20/2006 | 0.4-1.1 | intermediate terrace | dry | -- | SW | 7.3 | 39 | 680 | 320 | 400 | 1800 | 3200 | 450 | Alta |
| RE-66+00-SW680 | 11/3/2006 | 0.0-0.2 | wetland | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | AC | SM | | | | | | | | | Dow |
| RE-66+00-SW680 | 11/3/2006 | 0.2-1.1 | wetland | 10YR 4/3 brown loamy sand, few 10YR 5/8 yellowish brown mottle, 15<35% gravel, moist, subangular blocky, moist, firm, slightly plastic, common fine roots, petrochemical odor, construction fill-highly compacted faint petrochemical odor | -- | SM | 13.6 | 59 | 160 | 90 | 140 | 540 | 990 | 190 | Dow |
| RE-66+00-SW680 | 11/3/2006 | 1.1-2.2 | wetland | 10YR 4/3 brown loamy sand, few 10YR 5/8 yellowish brown mottle, 15<35% gravel, moist, subangular blocky, moist, firm, slightly plastic, common fine roots, petrochemical odor, construction fill-highly compacted faint petrochemical odor | -- | SM | 9.1 | 26 | 57 | 29 | 41 | 130 | 280 | 64 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-66+05-SW245 | 11/8/2006 | 1.1-4.0 Lab Duplicate | intermediate terrace | 2.5Y 4/2 dark grayish brown clay loam, 15<35% gravel, moist, subangular blocky, moist, very firm, moderately plastic, Fill material. Sample core recovery 3.1' out of 4.0'. | -- | ML/CL | 10.6 | | | 240 | 300 | 730 | 1300* | 190* | Dow |
| RE-66+05-SW245 | 11/8/2006 | 1.1-4.0 | intermediate terrace | 2.5Y 4/2 dark grayish brown clay loam, 15<35% gravel, moist, subangular blocky, moist, very firm, moderately plastic, Fill material. Sample core recovery 3.1' out of 4.0'. | -- | ML/CL | 10 | | | 380 | 380 | 740 | 1500* | 220* | Dow |
| RE-66+05-SW245 | 11/8/2006 | 4.0-5.6 | intermediate terrace | 2.5Y 4/2 dark grayish brown clay loam, common 10YR 6/8 brownish yellow mottle, 15<35% gravel, moist, subangular blocky, moist, very firm, moderately plastic, Fill material. | -- | ML/CL | 8.7 | <7 | 48 | 41 | 64 | 250 | 410 | 63 | Dow |
| RE-66+05-SW245 | 11/8/2006 | 5.6-7.1 | intermediate terrace | 10YR 3/1 very dark gray loam, moist, subangular blocky, moist, firm, slightly plastic, few fine roots, Trace of white freshwater snail shells. | C1 | SM | 15.6 | 37 | 63 | 56 | 200 | 630 | 980 | 180 | Dow |
| RE-66+05-SW245 | 11/8/2006 | 7.1-8.0 | intermediate terrace | 10YR 6/6 brownish yellow sand, wet, single grain, moist, loose, Non-plastic, Trace white freshwater snail shells. Sample core recovery; 3.6' out of 4.0'. | C2 | SP | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-66+05-SW245 | 11/8/2006 | 7.1-8.0 Field Duplicate | intermediate terrace | 10YR 6/6 brownish yellow sand, wet, single grain, moist, loose, Non-plastic, Trace white freshwater snail shells. Sample core recovery; 3.6' out of 4.0'. | C2 | SP | 16.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-66+05-SW430 | 11/13/2006 | 0.6-2.8 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay loam, 35<60% gravel, moist, structureless, moist, firm, moderately plastic, Fill sand and gravel in a clay matrix. Angular gravel. Pieces of concrete. | -- | CL | 12.4 | 160 | 9800 | 3800 | 4000 | 7500 | 25000 | 3500 | Alta |
| RE-66+05-SW430 | 11/13/2006 | 2.8-3.4 | intermediate terrace | 10YR 3/1 very dark gray loam, moist, structureless, moist, firm, moderately plastic, few very fine roots | Ab | CL | 14.7 | 9 | 130 | 69 | 65 | 180 | 450 | 68 | Alta |
| RE-66+05-SW430 | 11/13/2006 | 3.4-4.3 | intermediate terrace | 2.5Y 4/2 dark grayish brown clay loam, moist, subangular blocky, moderate, moist, firm, moderately plastic, very few very fine roots, Horizon is Bwb. | Bw | CL | 14.4 | <4 | 18 | 8 | 10 | 26 | 62 | 11 | Alta |
| RE-66+05-SW430 | 11/13/2006 | 4.3-5.2 | intermediate terrace | 2.5Y 4/4 olive brown fine sand, moist, single grain, moist, loose, Non-plastic | 2C2 | SP | 10.4 | <4 | 8 | 5 | 6 | 21 | 40* | <10* | Alta |
| RE-66+05-SW430 | 11/13/2006 | 5.2-6.3 Lab Duplicate | intermediate terrace | 2.5Y 5/4 light olive brown and 2.5Y 5/3 light olive brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fine gravel concentrated in thin layer at 6.0'. | 2C3 | SP | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-66+05-SW430 | 11/13/2006 | 5.2-6.3 | intermediate terrace | 2.5Y 5/4 light olive brown and 2.5Y 5/3 light olive brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fine gravel concentrated in thin layer at 6.0'. | 2C3 | SP | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-66+05-SW65 | 11/13/2006 | 1.1-2.5 | intermediate terrace | dry | -- | SW | 9.4 | 850 | 2700 | 2100 | 7100 | 52000 | 65000 | 9400 | Alta |
| RE-66+05-SW65 | 11/13/2006 | 2.5-3.9 | intermediate terrace | dry | -- | SW | 11.4 | 97 | 750 | 990 | 4100 | 23000 | 29000 | 4200 | Alta |
| RE-66+05-SW65 | 11/13/2006 | 3.9-5.8 | intermediate terrace | 7.5YR 4/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, subrounded grains | 2C | SM | 9.9 | 6 | 95 | 56 | 130 | 940 | 1200 | 170 | Alta |
| RE-66+05-SW65 | 11/13/2006 | 5.8-6.5 | intermediate terrace | 7.5YR 4/4 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, subrounded grains | 2C2 | SM | 11.4 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RE-66+05-SW65 | 11/13/2006 | 6.5-7.0 | intermediate terrace | 10YR 3/2 very dark grayish br very fine sandy loam, moist, granular, moist, friable, moderately plastic | 3C | SM | 17.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-68+00-SW250 | 11/3/2006 | 0.0-1.0 | intermediate terrace | 10YR 3/3 dark brown loam, 15-35% gravel, moist, subangular blocky, moist, firm, slightly plastic, common fine roots, highly compacted fill material REFUSAL | -- | SM | 9.1 | <4 | 10 | 5 | 12 | 36 | 63 | 11 | Dow |
| RE-69+50-IC-NE | 9/24/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, somewhat well sorted Black material | 1 | SP | 5.1 | <4 | <4 | <4 | <4 | 21 | 21 * | <10 * | Alta |
| RE-69+50-IC-NE | 9/24/2006 | 0.4-1.2 | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand,very few fine gravel, very few shell fragments, somewhat well sorted | 2 | SP | 16.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-69+50-IC-NE | 9/24/2006 | 0.4-1.2 Field Duplicate | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand,very few fine gravel, very few shell fragments, somewhat well sorted | 2 | SP | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-69+50-SW20 | 9/20/2006 | 0.0-0.8 | floodplain | 10YR 3/3 dark brown and 10YR 5/3 brown fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots, Alternating layers of fine sandy loam and fine sand, granular to single-grain, non-plastic to slightly plastic, very friable to loose | A | SP-SC | 18.2 | <7 | <9 | <8 | <9 | 19 | <37 * | <10 * | Alta |
| RE-69+50-SW20 | 9/20/2006 | 0.8-1.4 | floodplain | Angular gravel, clay and sand | -- | -- | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-69+50-SW250 | 9/20/2006 | 0.0-0.5 | intermediate terrace | 10YR 4/2 dark grayish brown , angular blocky, common very fine roots, Color- 10YR 4/3 Fill material with brick pieces, Refusal at 0.5' | A | -- | 13.9 | 63 | 24 | 94 | 340 | 7300 | 7800 | 990 | Alta |
| RE-69+50-SW50 | 9/20/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, dry, dry, loose, Non-plastic, many very fine roots, fine sand and loamy fine sand, very fine and fine roots | A | SP | 14.1 | 33 | 110 | 54 | 140 | 420 | 760 | 140 | Alta |
| RE-69+50-SW50 | 9/20/2006 | 0.3-0.8 | intermediate terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, little coarse sand | C | SP | 8 | 70 | 260 | 140 | 270 | 820 | 1600 | 290 | Alta |

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-69+55-SW250 | 11/13/2006 | 0.5-1.5 | intermediate terrace | 10YR 4/3 brown sandy clay loam, <15% gravel, dry, angular blocky, dry, very hard, moderately plastic, Fill material, few fine and medium angular gravel, common coarse sand | C | CL | 6.5 | <4 | 4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RE-69+55-SW250 | 11/13/2006 | 1.5-2.5 | intermediate terrace | 10YR 4/3 brown sandy clay loam, <15% gravel, dry, angular blocky, dry, very hard, moderately plastic, Fill material, few fine and medium angular gravel, common coarse sand | C | CL | 6.6 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RE-69+55-SW250 | 11/13/2006 | 2.5-3.5 | intermediate terrace | 10YR 4/3 brown sandy clay loam, <15% gravel, dry, angular blocky, dry, very hard, moderately plastic, Fill material, few fine and medium angular gravel, common coarse sand | C | CL | 9.8 | <4 | 10 | 6 | <4 | 28 | 44* | <10 * | Alta |
| RE-69+55-SW50 | 11/13/2006 | 0.8-2.7 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy very fine sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, few coarse sand | C2 | SM | 9.1 | 20 | 28 | 17 | 30 | 200 | 290 | 57 | Alta |
| RE-69+55-SW50 | 11/13/2006 | 0.8-2.7 | intermediate terrace | 10YR 3/2 very dark grayish br loamy very fine sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, few coarse sand | C2 | SM | 9.5 | 22 | 33 | 16 | 24 | 200 | 300 | 59 | Alta |
| RE-69+55-SW50 | 11/13/2006 | 2.7-3.8 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, subrounded grains, somewhat well sorted | 2C | SP | 6.1 | <4 | <4 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RE-69+55-SW50 | 11/13/2006 | 3.8-4.2 | intermediate terrace | 10YR 5/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few coarse sand, subrounded grains, well sorted | 3C | SP | 6.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-72+00-SW200 | 11/3/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loam, <15% gravel, moist, granular, moist, friable, moderately plastic, common fine roots, Organic weak A horizon on fill | Aw | SM | 20.3 | 6 | 22 | 21 | 26 | 82 | 160 | 28 | Dow |
| RE-72+00-SW200 | 11/3/2006 | 0.3-1.1 | intermediate terrace | 10YR 4/3 brown clay loam, 15<35% gravel, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, petrochemical odor, Fill, petrochemical odor. | -- | ML/CL | 6.6 | <4 | 9 | 4 | 4 | 14 | 30* | <10 * | Dow |
| RE-72+00-SW200 | 11/3/2006 | 1.1-2.2 | intermediate terrace | 10YR 4/3 brown clay loam, 15<35% gravel, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, petrochemical odor, Fill, petrochemical odor. | -- | ML/CL | 7.7 | <4 | 9 | <4 | 4 | 10 | 24* | <10 * | Dow |
| RE-74+00-IC-C | 9/24/2006 | 0.0-0.6 | in-channel | 10YR 4/3 brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, few coarse roots, noncohesive, subrounded and subangular grains, common fine gravel, few shell fragments, poorly sorted | 1 | SW | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-C | 9/24/2006 | 0.6-1.1 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few fine gravel, very few shell fragments, somewhat poorly sorted | 2 | SW | 11.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-C | 9/24/2006 | 1.1-1.5 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, few fine gravel, few shell fragments, somewhat poorly sorted | 3 | SW | 17.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

Estimated Total TEQ is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-74+00-IC-NE | 9/24/2006 | 0.0-0.6 | in-channel | 10YR 4/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium and coarse sand, very few shell fragments, well sorted | 1 | SP | 3.5 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RE-74+00-IC-NE | 9/24/2006 | 0.6-1.6 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, well sorted | 2 | SP | 8.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-NE | 9/24/2006 | 0.6-1.6 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, well sorted | 2 | SP | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-NE | 9/24/2006 | 1.6-2.2 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, noncohesive, subrounded grains, few coarse sand, very few shell fragments, well sorted | 3 | SP | 14.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-SW | 9/24/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few fine gravel, few shell fragments, somewhat poorly sorted | 1 | SW | 6.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-SW | 9/24/2006 | 0.0-0.5 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few fine gravel, few shell fragments, somewhat poorly sorted | 1 | SW | 6.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-SW | 9/24/2006 | 0.5-1.1 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few medium roots, noncohesive, subrounded grains, few coarse sand, very few fine gravel, very few shell fragments, somewhat well sorted, medium and coarse roots | 2 | SP | 15.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-IC-SW | 9/24/2006 | 0.5-1.1 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few medium roots, noncohesive, subrounded grains, few coarse sand, very few fine gravel, very few shell fragments, somewhat well sorted, medium and coarse roots | 2 | SP | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-SW180 | 9/21/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A1 | SC | 18.6 | 9 | 15 | 13 | 16 | 97 | 150 | 27 | Alta |
| RE-74+00-SW180 | 9/21/2006 | 0.4-2.2 | intermediate terrace | 10YR 4/2 dark grayish brown, dry, angular blocky, dry, very hard, Gravelly clay fill Refusal @ 2.2' | -- | -- | 7.1 | <4 | 6 | 4 | <4 | 14 | 24* | <10 * | Alta |
| RE-74+00-SW20 | 9/20/2006 | 0.0-0.7 | low terrace | 10YR 4/2 dark grayish brown loamy fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots | A | SP | 11.3 | <4 | 23 | 6 | 58 | 21 | 110 | 27 | Alta |
| RE-74+00-SW20 | 9/20/2006 | 0.7-1.5 | low terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, few very fine roots | C | SP | 8.5 | 12 | 62 | 30 | 23 | 40 | 170 | 33 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-74+00-SW45 | 9/21/2006 | 0.0-1.5 | intermediate terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, Color-alternating layers of 10YR 5/4 and 10 YR 4/3 Recent deposition | -- | SP | 8 | 17 | 22 | 15 | 19 | 71 | 140 | 35 | Alta |
| RE-74+00-SW45 | 9/21/2006 | 1.5-2.2 | intermediate terrace | 10YR 5/2 grayish brown , dry, angular blocky, dry, very hard, moderately plastic, Gravely clay fill | -- | -- | 6 | 170 | 83 | 45 | 72 | 240 | 610 | 250 | Alta |
| RE-74+00-SW45 | 9/21/2006 | 2.2-2.5 | intermediate terrace | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, dry, granular, dry, loose, slightly plastic, Fine gravel (fill) | Ab | SC | 8.8 | 55 | 82 | 74 | 160 | 580 | 950 | 190 | Alta |
| RE-74+00-SW45 | 9/21/2006 | 2.5-3.2 | intermediate terrace | 10YR 4/4 dark yellowish brown very fine sandy loam, dry, subangular blocky, dry, slightly plastic, friable horizon- Bs/b | Bs | SC | 4.4 | <4 | 16 | 4 | 16 | 58 | 94 | 16 | Alta |
| RE-74+00-SW45 | 9/21/2006 | 3.2-4.8 | intermediate terrace | 10YR 5/6 yellowish brown very fine sand, dry, single grain, dry, loose, Non-plastic, 10YR 6/2 light brownish gray reduced areas Horizon- Bs2b | Bs2 | SP | 5.9 | <4 | <4 | <4 | <4 | 9 | <20 * | <10 * | Alta |
| RE-74+00-SW45 | 9/21/2006 | 4.8-6.1 | intermediate terrace | 10YR 5/2 grayish brown very fine sand, many 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic | C1 | SP | 10.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-SW45 | 9/21/2006 | 6.1-6.6 | intermediate terrace | 10YR 6/2 light brownish gray sand, many 10YR 5/8 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, Mottles- 7/5 YR 5/8 | C2 | SP | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-74+00-SW50 | 9/20/2006 | 0.0-0.7 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots, granular to single grain, soft to loose | A | SP | 13.9 | 45 | 85 | 37 | 48 | 180 | 400 | 96 | Alta |
| RE-74+00-SW50 | 9/20/2006 | 0.7-2.0 | intermediate terrace | 10YR 4/3 brown clay, 35-60% gravel, dry, dry, very hard, gravely clay fill, extremely hard, dry | 2C | -- | 6.9 | 97 | 120 | 60 | 82 | 360 | 720 | 190 | Alta |
| RE-74+00-SW50 | 9/20/2006 | 2.0-2.6 | intermediate terrace | 10YR 3/1 very dark gray loamy fine sand, dry, subangular blocky, dry, slightly hard, slightly plastic, subangular blocky to granular | 3Ab | SC | 8.7 | 59 | 220 | 120 | 190 | 1000 | 1600 | 270 | Alta |
| RE-74+00-SW50 | 9/20/2006 | 2.6-4.4 | intermediate terrace | 10YR 6/3 pale brown very fine sand, many 10YR 5/6 yellowish brown mottle, dry, single grain, dry, loose, Non-plastic, Horizon- 3Bs1b medium and coarse prominent mottles | 3Bs1 | SP | 8.1 | <4 | 4 | <4 | <4 | 16 | 20* | <10 * | Alta |
| RE-74+00-SW50 | 9/20/2006 | 4.4-5.1 | intermediate terrace | 10YR 6/3 pale brown fine sand, many 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, Horizon- 3Bs2b medium and coarse prominent mottles | 3Bs2 | SP | 10.8 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RE-74+00-SW50 | 9/20/2006 | 5.1-6.6 | intermediate terrace | 2.5Y 6/2 light brownish gray and 10YR 6/6 brownish yellow sand, moist, single grain, moist, loose, Non-plastic, medium and some fine sand, two thin layers of secondary color (medium sand- SP) | 3C | SW | 6.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-80+00-IC-C | 9/24/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common medium and coarse sand, few shell fragments, somewhat well sorted | 1 | SP | 3.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-IC-C | 9/24/2006 | 0.5-1.0 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded grains, common coarse sand, very few fine gravel, few shell fragments, somewhat well sorted | 2 | SP | 8.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-IC-C | 9/24/2006 | 1.0-1.2 | in-channel | 10YR 4/1 dark gray loamy sand, wet, single grain, moist, loose, Non-plastic, common medium roots, noncohesive, subrounded and subangular grains, common shell fragments, medium and coarse roots Black material | 3 | SM | 17.7 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RE-80+00-IC-C | 9/24/2006 | 1.2-1.6 | in-channel | 10YR 3/1 very dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, common fine gravel, few shell fragments, poorly sorted | 4 | SW | 10.3 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RE-80+00-IC-NE | 9/24/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded and subangular grains, common coarse sand, very few fine gravel, few shell fragments, somewhat well sorted | 1 | SP | 8.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-IC-NE | 9/24/2006 | 0.5-0.9 | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, somewhat well sorted | 2 | SP | 16.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-IC-NE | 9/24/2006 | 0.9-1.3 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, common fine sand, few fine gravel, few shell fragments, poorly sorted | 3 | SW | 15.5 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RE-80+00-IC-SW | 9/24/2006 | 0.0-0.4 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded and subangular grains, common coarse sand, very few fine gravel, very few shell fragments, somewhat well sorted | 1 | SP | 16.2 | <4 | 19 | 30 | 10 | 210 | 260 | 29 | Alta |
| RE-80+00-IC-SW | 9/24/2006 | 0.4-0.7 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few medium roots, medium and coarse sand, noncohesive, subrounded and subangular grains, few fine and medium gravel, few shell fragments, poorly sorted | 2 | SW | 14.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW110 | 9/21/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, dry, granular, dry, slightly plastic, many very fine roots, very friable | A | SC | 14.8 | 5 | 17 | <8 | 13 | 43 | 77 | 17 | Alta |
| RE-80+00-SW110 | 9/21/2006 | 0.3-1.5 | intermediate terrace | dry, angular blocky, dry, very hard, Gravelly clay fill Refusal @ 1.5' | -- | GW | 4.3 | <4 | 38 | 12 | 12 | 15 | 77 | 12 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-80+00-SW175 | 9/21/2006 | 0.0-0.4 | low intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, granular, moist, very friable, Non-plastic, common very fine roots | A | SP | 9.5 | 5 | 11 | 6 | 12 | 42 | 76 | 16 | Alta |
| RE-80+00-SW175 | 9/21/2006 | 0.4-1.4 | low intermediate terrace | dry, angular blocky, dry, very hard, Gravelly clay fill | -- | GW | 3.9 | 16 | 27 | 22 | 32 | 140 | 230 | 47 | Alta |
| RE-80+00-SW175 | 9/21/2006 | 1.4-3.0 | low intermediate terrace | 10YR 4/4 dark yellowish brown sandy clay loam, dry, subangular blocky, dry, moderately plastic, friable to firm | C1 | CL | 9.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW175 | 9/21/2006 | 3.0-3.5 | low intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, few 10YR 4/6 dark yellowish brown mottle, dry, single grain, dry, very hard, Non-plastic | 2C2 | SP | 6.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW20 | 9/21/2006 | 0.0-0.8 | natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A1 | SC | 12 | 5 | 91 | 67 | 47 | 140 | 350 | 49 | Alta |
| RE-80+00-SW20 | 9/21/2006 | 0.8-1.7 | natural levee | 10YR 3/3 dark brown fine sandy loam, moist, angular blocky, moist, very friable, slightly plastic | Bw1 | SC | 15.3 | <4 | 10 | 5 | 4 | 9 | 28* | <10* | Alta |
| RE-80+00-SW20 | 9/21/2006 | 1.7-2.2 | natural levee | 10YR 4/3 brown loamy fine sand, dry, subangular blocky, dry, loose, slightly plastic | C1 | SP | 8.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW20 | 9/21/2006 | 2.2-3.3 | natural levee | 10YR 5/2 grayish brown loamy fine sand, many 10YR 4/6 dark yellowish brown mottle, subangular blocky, moist, very friable, Non-plastic, Subangular blocky parting to single grain | C2 | SP | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW20 | 9/21/2006 | 3.3-5.9 | natural levee | 10YR 5/2 grayish brown fine sand, many 10YR 4/6 dark yellowish brown mottle, single grain, Non-plastic, loose | C3 | SP | 4.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW20 | 9/21/2006 | 5.9-6.6 | natural levee | 2.5Y 6/2 light brownish gray loamy very fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, very friable, slightly plastic, Subangular blocky to single grain Slightly plastic to nonplastic Very friable to loose | C4 | SP | 9.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RE-80+00-SW270 | 9/21/2006 | 0.0-0.5 | intermediate terrace | 10YR 4/2 dark grayish brown sandy loam, <15% gravel, dry, granular, dry, slightly plastic, friable slightly to moderately plastic | A | SC | 14.7 | <4 | <4 | <4 | <4 | 4 | <20* | <10* | Alta |
| RE-80+00-SW270 | 9/21/2006 | 0.5-1.0 | intermediate terrace | common mottle, dry, angular blocky, dry, very hard, Gravelly clay fill | -- | GW | 4 | 13 | 51 | 39 | 31 | 220 | 350 | 55 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach E

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RE-80+00-SW50 | 9/21/2006 | 0.0-0.3 | low intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, dry, granular, dry, slightly plastic, common very fine roots, very friable | A4 | SC | 15.4 | 21 | 37 | 21 | 28 | 150 | 260 | 54 | Alta |
| RE-80+00-SW50 | 9/21/2006 | 0.3-2.8 | low intermediate terrace | angular blocky, very hard, Gravelly clay fill | -- | GW | 4.6 | 40 | 27 | 13 | 25 | 120 | 220 | 68 | Alta |
| RE-80+00-SW50 | 9/21/2006 | 2.8-4.0 | low intermediate terrace | 10YR 4/4 dark yellowish brown fine sandy loam, common 10YR 5/2 grayish brown mottle, dry, subangular blocky, dry, loose, Non-plastic, Alternating layers of 10YR 4/4 and 10 YR 6/2 single grained sands and subangular blocky sandy loam nonplastic to slightly plastic very friable to loose | C1 | SP-SC | 5.8 | 5 | 7 | 5 | 9 | 40 | 65 | 13 | Alta |
| RE-80+00-SW50 | 9/21/2006 | 4.0-4.4 | low intermediate terrace | 10YR 4/6 dark yellowish brown coarse sand, moist, single grain, moist, loose, Non-plastic, Refusal @ 4.5' 2C2 horizon fill gravel for drainage channel cut behind natural levee | 2C2 | GC | 6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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"SL" indicates sample lost during laboratory analysis.



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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-103+50-IC-C | 10/4/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, well sorted | 1 | SP | 4.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-IC-C | 10/4/2006 | 0.4-0.9 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, medium sand, noncohesive, subrounded grains, few coarse sand, well sorted, few shell fragments | 2 | SP | 12.4 | <4 | 4 | <4 | <4 | 19 | 23* | <10* | Alta |
| RF-103+50-IC-C | 10/4/2006 | 0.9-1.4 | in-channel | 10YR 3/2 very dark grayish br, > or =90% gravel, wet, single grain, moist, loose, Non-plastic, fine gravel, noncohesive, subrounded, subangular and angular grains, common sand, poorly sorted Layer of black material at 1.3' | 3 | GW | 13.5 | <4 | 270 | 74 | 73 | 170 | 590 | 77 | Alta |
| RF-103+50-IC-NE | 10/3/2006 | 0.0-2.1 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few medium wood not layered, very few shell fragments, very few medium and coarse sand, well sorted Field Duplicate | 1 | SP | 2.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-103+50-IC-NE | 10/3/2006 | 0.0-2.1 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few medium wood not layered, very few shell fragments, very few medium and coarse sand, well sorted Field Duplicate | 1 | SP | 2.2 | <4 | <4 | <4 | <4 | 13 | <20* | <10* | Dow |
| RF-103+50-IC-NE | 10/3/2006 | 2.1-2.5 | in-channel | 10YR 4/2 dark grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand and fine gravel, somewhat well sorted | 2 | SP | 11.6 | <4 | 19 | 5 | 6 | 6 | 37* | <10* | Dow |
| RF-103+50-IC-NE | 10/3/2006 | 2.5-3.0 | in-channel | 10YR 4/1 dark gray sand, 35-60% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, fine and medium gravel, few shell fragments, poorly sorted | 3 | SW | 9.3 | 9 | 12000 | 3700 | 4000 | 2200 | 21000 | 2900 | Dow |
| RF-103+50-IC-NE | 10/3/2006 | 3.0-3.3 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded and subangular grains, common coarse sand, very few coarse black material, fine gravel, very few shell fragments, somewhat poorly sorted | 4 | SW | 15.7 | <4 | 110 | 63 | 37 | 330 | 540 | 65 | Alta |
| RF-103+50-IC-SW | 10/4/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, well sorted | 1 | SP | 4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-IC-SW | 10/4/2006 | 0.3-0.9 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded grains, few coarse sand, well sorted, very few shell fragments | 2 | SP | 14.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-IC-SW | 10/4/2006 | 0.9-1.2 | in-channel | 10YR 3/1 very dark gray, > or =90% gravel, wet, single grain, moist, loose, Non-plastic, fine gravel, noncohesive, subrounded, subangular, and angular grains, common sand Layer of black material at 1.1' | 3 | GW | 16.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-103+50-SW150 | 9/25/2006 | 0.0-1.4 | wetland | 10YR 4/2 dark grayish brown fine sandy loam, moist, granular, moist, friable, slightly plastic, many very fine roots, fine sandy loam to loam, SC/CL, granular to subangular blocky, very fine, fine, and medium roots | A | SC | 19.5 | 160 | 80 | 36 | 45 | 240 | 550 | 220 | Alta |
| RF-103+50-SW150 | 9/25/2006 | 1.4-2.0 | wetland | 10YR 3/3 dark brown silt loam, <15% gravel, dry, dry, slightly hard, slightly plastic, very few fine roots, thin layer of 10YR 4/4 medium sand with medium and fine rounded gravel at 1.9' (0.1' in thickness) | C1 | ML | 10.2 | 53 | 96 | 55 | 49 | 210 | 460 | 110 | Alta |
| RF-103+50-SW150 | 9/25/2006 | 2.0-4.0 | wetland | 10YR 6/3 pale brown clay, common 10YR 4/6 dark yellowish brown mottle, dry, dry, very hard, very plastic, White powdery film visible, sometime deposited along root traces fine and medium distinct mottles | 2C2 | CH | 12.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 0.0-1.2 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots, SC/SM | A | SC | 16 | 240 | 310 | 190 | 180 | 520 | 1400 | 420 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 1.2-2.2 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C1 | SC | 5.7 | 21 | 160 | 83 | 86 | 130 | 480 | 86 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 2.2-3.5 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C1 | SC | 5.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 3.5-4.2 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C1 | SC | 8.3 | 18 | 17 | 10 | 10 | 30 | 85 | 28 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 4.2-5.7 | high terrace | 10YR 3/4 dark yellowish brown fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C2 | SC | 8.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 5.7-6.8 | high terrace | 10YR 3/4 dark yellowish brown fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C2 | SC | 10.1 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RF-103+50-SW20 | 9/25/2006 | 6.8-8.0 | high terrace | 10YR 3/6 dark yellowish brown very fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C3 | SC | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-SW20 | 9/25/2006 | 8.0-9.1 | high terrace | 10YR 3/6 dark yellowish brown very fine sandy loam, moist, moist, friable, slightly plastic, SC/SM | C3 | SC | 17.4 | <4 | 5 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RF-103+50-SW220 | 9/25/2006 | 0.0-0.2 Field Duplicate | low terrace | 10YR 4/2 dark grayish brown loam, moist, granular, moist, friable, slightly plastic, many very fine roots, loam to sandy clay loam, slightly to moderately plastic | A | CL | 22.3 | 9 | 31 | 16 | 23 | 110 | 190 | 33 | Alta |
| RF-103+50-SW220 | 9/25/2006 | 0.0-0.2 | low terrace | 10YR 4/2 dark grayish brown loam, moist, granular, moist, friable, slightly plastic, many very fine roots, loam to sandy clay loam, slightly to moderately plastic | A | CL | 25.3 | 35 | 45 | 21 | 32 | 130 | 270 | 70 | Alta |
| RF-103+50-SW220 | 9/25/2006 | 0.2-2.2 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown clay, 35-60% gravel, moist, moist, extremely firm, 10YR 4/4 Fill - gravelly clay fill, clay and sand matrix, with unsorted angular gravel, very firm to extremely firm | C | -- | 9 | <4 | 10 | 5 | 5 | 18 | 38* | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-103+50-SW90 | 9/25/2006 | 0.0-0.8 | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 16.3 | 270 | 300 | 190 | 190 | 530 | 1500 | 460 | Alta |
| RF-103+50-SW90 | 9/25/2006 | 0.8-2.2 | low terrace | 10YR 4/4 dark yellowish brown loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots, fine to medium mottles, trace freshwater shells, < 2mm | C1 | SM | 10.5 | 7 | 8 | 5 | 5 | 14 | 40* | 12* | Alta |
| RF-103+50-SW90 | 9/25/2006 | 2.2-3.3 | low terrace | 10YR 4/4 dark yellowish brown loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots, fine to medium mottles, trace freshwater shells, < 2mm | C1 | SM | 16.3 | 7 | 6 | <4 | 4 | 12 | 30* | <10* | Alta |
| RF-103+50-SW90 | 9/25/2006 | 3.3-4.4 | low terrace | 10YR 4/6 dark yellowish brown loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, medium, few to common mottles, trace of white freshwater shells, < 1mm diameter | C2 | SM | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-103+50-SW90 | 9/25/2006 | 4.4-5.5 | low terrace | 10YR 4/6 dark yellowish brown loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, medium, few to common mottles, trace of white freshwater shells, < 1mm diameter | C2 | SM | 14.6 | <4 | 12 | 5 | 4 | 6 | 27* | <10* | Alta |
| RF-103+50-SW90 | 9/25/2006 | 5.5-6.6 | low terrace | 10YR 4/6 dark yellowish brown loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, medium, few to common mottles, trace of white freshwater shells, < 1mm diameter | C2 | SM | 18.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-109+00-SW165 | 9/25/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br silt loam, moist, moist, friable, slightly plastic, many very fine roots, very fine and fine roots | A | ML | 24.4 | 9 | 23 | 13 | 18 | 59 | 120 | 26 | Alta |
| RF-109+00-SW165 | 9/25/2006 | 0.0-0.3 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br silt loam, moist, moist, friable, slightly plastic, many very fine roots, very fine and fine roots | A | ML | 23.8 | 8 | 31 | 16 | 23 | 83 | 160 | 29 | Alta |
| RF-109+00-SW165 | 9/25/2006 | 0.3-1.3 | intermediate terrace | Gravelly clay fill - clay and sand matrix with unsorted angular gravel, very hard | -- | -- | 8.6 | <4 | 7 | <4 | <4 | 9 | <20* | <10* | Alta |
| RF-109+00-SW165 | 9/25/2006 | 1.3-2.6 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br loamy fine sand, moist, moist, very friable, Non-plastic, common fine roots, Additional color - 10YR 4/4 thin layers of fine sandy loam, fine and medium roots | C1 | SP | 7.9 | 9 | 13 | 7 | 6 | 20 | 54 | 16 | Alta |
| RF-109+00-SW165 | 9/25/2006 | 2.6-3.5 | intermediate terrace | 10YR 4/3 brown loam, moist, angular blocky, moist, friable, slightly plastic, loam to sandy clay loam, slightly to moderately plastic | C2 | CL | 13.6 | 94 | 240 | 130 | 110 | 280 | 840 | 200 | Alta |
| RF-109+00-SW30 | 9/22/2006 | 0.0-0.3 Lab Duplicate | low intermediate terrace | 10YR 4/2 dark grayish brown clay loam, dry, granular, dry, slightly hard, moderately plastic, many very fine roots, Slightly to moderately hard, very fine, fine, and medium roots | A | CL | 15.7 | 7 | 580 | 290 | 300 | 380 | 1500 | 220 | Dow |
| RF-109+00-SW30 | 9/22/2006 | 0.0-0.3 | low intermediate terrace | 10YR 4/2 dark grayish brown clay loam, dry, granular, dry, slightly hard, moderately plastic, many very fine roots, Slightly to moderately hard, very fine, fine, and medium roots | A | CL | 15.2 | 10 | 530 | 310 | 270 | 340 | 1500 | 210 | Dow |
| RF-109+00-SW30 | 9/22/2006 | 0.3-1.1 | low intermediate terrace | dry, dry, very hard, Compacted gravelly clay fill - clay matrix with coarse sand and fine to medium angular unsorted gravel | -- | -- | 6.3 | 4 | 630 | 340 | 300 | 360 | 1600 | 220 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-109+00-SW35 | 9/25/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, many very fine roots, very fine and fine roots | A | ML | 27.2 | 14 | 270 | 160 | 120 | 190 | 740 | 110 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 0.3-2.2 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few roots, very fine sandy loam to loam, SC/SM, moist to 1.1 then dry Thin (0.1') layer of whitish material at 2.3'. Unidentified but may be dry, compacted, light-colored sand. Too this to sample discretely | C1 | SC | 8.6 | 140 | 210 | 120 | 130 | 440 | 1000 | 270 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 0.3-2.2 Field Duplicate | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few roots, very fine sandy loam to loam, SC/SM, moist to 1.1 then dry Thin (0.1') layer of whitish material at 2.3'. Unidentified but may be dry, compacted, light-colored sand. Too this to sample discretely | C1 | SC | 9.8 | 150 | 180 | 110 | 120 | 380 | 930 | 270 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 2.2-3.3 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few roots, very fine sandy loam to loam, SC/SM, moist to 1.1 then dry Thin (0.1') layer of whitish material at 2.3'. Unidentified but may be dry, compacted, light-colored sand. Too this to sample discretely | C1 | SC | 12.7 | 470 | 190 | 150 | 150 | 610 | 1600 | 650 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 3.3-4.2 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few roots, very fine sandy loam to loam, SC/SM, moist to 1.1 then dry Thin (0.1') layer of whitish material at 2.3'. Unidentified but may be dry, compacted, light-colored sand. Too this to sample discretely | C1 | SC | 12.8 | 84 | 210 | 140 | 120 | 450 | 1000 | 210 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 4.2-6.2 | intermediate terrace | 10YR 4/3 brown and 10YR 4/4 dark yellowish brown loam, moist, angular blocky, moist, friable, slightly plastic, slightly to moderately plastic | C2 | ML/CL | 15.7 | 8 | 1700 | 760 | 600 | 560 | 3600 | 480 | Alta |
| RF-109+00-SW35 | 9/25/2006 | 6.2-7.7 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, common 10YR 5/6 yellowish brown and 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, very fine and fine sand, coarse mottles Many thin layers of decomposing or buried organic matter (primarily wood). Some thin layers of sandy loam to sandy clay loam (10YR 4/2) | C3 | SP | 5.9 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RF-109+00-SW35 | 9/25/2006 | 7.7-8.8 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, common 10YR 5/6 yellowish brown and 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, very fine and fine sand, coarse mottles Many thin layers of decomposing or buried organic matter (primarily wood). Some thin layers of sandy loam to sandy clay loam (10YR 4/2) | C3 | SP | 17 | <4 | 13 | 6 | 5 | 7 | 31 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-109+05-SW165 | 11/8/2006 | 3.5-4.4 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 4/3 brown sandy clay loam, <15% gravel, moist, angular blocky, moist, friable, moderately plastic, freshwater shells, gravel rounded | C3 | CL | 17.7 | 43 | 170 | 87 | 88 | 130 | 520 | 110 | Dow |
| RF-109+05-SW165 | 11/8/2006 | 4.4-4.8 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay loam, 15<35% gravel, moist, structureless, moist, friable, moderately plastic, gravel rounded | C4 | CL | 11.5 | 7 | 26 | 11 | 16 | 29 | 88 | 19 | Dow |
| RF-109+05-SW165 | 11/8/2006 | 4.8-5.7 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 4/2 dark grayish brown clay loam, <15% gravel, moist, structureless, moist, firm, moderately plastic, some rounded and angular gravel | C5 | CL | 15.8 | 50 | 270 | 140 | 130 | 280 | 870 | 160 | Dow |
| RF-109+05-SW165 | 11/8/2006 | 5.7-6.8 Field Duplicate | intermediate terrace | 10YR 5/3 brown clay loam, few 10YR 5/4 yellowish brown mottle, moist, structureless, moist, firm, moderately plastic | C6 | CL | 15.3 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RF-109+05-SW165 | 11/8/2006 | 5.7-6.8 | intermediate terrace | 10YR 5/3 brown clay loam, few 10YR 5/4 yellowish brown mottle, moist, structureless, moist, firm, moderately plastic | C6 | CL | 14.9 | <4 | 24 | 11 | 10 | 11 | 56 | 10 | Dow |
| RF-109+05-SW165 | 11/8/2006 | 6.8-8.0 Field Duplicate | intermediate terrace | 10YR 5/2 grayish brown loam, common 10YR 4/6 dark yellowish brown and 10YR 3/1 very dark gray mottle, wet, structureless, moist, friable, slightly plastic | C7 | ML/CL | 19.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-109+05-SW165 | 11/8/2006 | 6.8-8.0 | intermediate terrace | 10YR 5/2 grayish brown loam, common 10YR 4/6 dark yellowish brown and 10YR 3/1 very dark gray mottle, wet, structureless, moist, friable, slightly plastic | C7 | ML/CL | 19.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-109+05-SW165 | 11/8/2006 | 6.8-8.0 Lab Duplicate | intermediate terrace | 10YR 5/2 grayish brown loam, common 10YR 4/6 dark yellowish brown and 10YR 3/1 very dark gray mottle, wet, structureless, moist, friable, slightly plastic | C7 | ML/CL | 19.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-109+05-SW30 | 11/8/2006 | 1.1-2.5 | low terrace | dry, dry, very hard, Compacted gravelly clay fill - clay matrix with coarse sand and fine to medium angular unsorted gravel | -- | -- | 8.6 | <4 | 13 | <5 | <5 | 10 | 23* | <10 * | Dow |
| RF-109+05-SW30 | 11/8/2006 | 2.5-4.0 | low terrace | dry, dry, very hard, Compacted gravelly clay fill - clay matrix with coarse sand and fine to medium angular unsorted gravel | -- | -- | 9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-109+05-SW30 | 11/8/2006 | 4.0-5.5 | low terrace | dry, dry, very hard, Compacted gravelly clay fill - clay matrix with coarse sand and fine to medium angular unsorted gravel | -- | -- | 9.3 | <4 | 6 | <4 | 4 | 6 | <20 * | <10 * | Dow |
| RF-112+50-IC-C | 10/4/2006 | 0.0-1.1 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded and subangular grains, common coarse sand, common shell fragments, fine and medium gravel, poorly sorted Layers of black material at 0.3' and 0.9-1.1' | 1 | SW | 13.4 | <4 | 5 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RF-112+50-IC-C | 10/4/2006 | 0.0-1.1 Field Duplicate | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded and subangular grains, common coarse sand, common shell fragments, fine and medium gravel, poorly sorted Layers of black material at 0.3' and 0.9-1.1' | 1 | SW | 12.8 | <4 | 5 | <4 | <4 | 9 | <20 * | <10 * | Alta |

NOTES:

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"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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1/31/2007

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-112+50-IC-NE | 10/4/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, well sorted, very few shell fragments | 1 | SP | 4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-112+50-IC-NE | 10/4/2006 | 0.6-1.3 | in-channel | 10YR 4/2 dark grayish brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded and subangular grains, common coarse sand, few shell fragments, somewhat poorly sorted | 2 | SW | 3.8 | <4 | 23 | 5 | 4 | 8 | 40* | <10 * | Alta |
| RF-112+50-IC-NE | 10/4/2006 | 1.3-2.3 | in-channel | 10YR 4/1 dark gray sand, 35<60% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, few shell fragments, poorly sorted | 3 | SW | 10.5 | <4 | 24 | 7 | 5 | 15 | 51 | <10 * | Alta |
| RF-112+50-IC-SW | 10/4/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, few coarse sand, few shell fragments, fine gravel, fine and medium roots/black material | 1 | SM | 21.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-112+50-IC-SW | 10/4/2006 | 0.3-0.7 | in-channel | > or =90% gravel, wet, single grain, moist, loose, Non-plastic, Variable color, fine gravel, noncohesive, subrounded and subangular grains, common sand, poorly sorted, medium gravel, few shell fragments | 2 | GW | 4.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-112+50-IC-SW | 10/4/2006 | 0.7-1.0 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, many fine roots, noncohesive, fine and coarse roots/black material, few shell fragments | 3 | SM | 63.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-112+50-IC-SW | 10/4/2006 | 1.0-1.3 | in-channel | 10YR 4/1 dark gray very fine sandy loam, <15% gravel, wet, granular, moist, friable, slightly plastic, very few medium roots, cohesive, fine and medium gravel concentrated at bottom of core | 4 | SM | 29.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-112+50-SW110 | 9/22/2006 | 0.0-1.9 | intermediate terrace | Compacted gravelly clay fill - clay matrix with coarse sand and fine and medium unsorted angular gravel. Very hard, Incipient (very thin) A horizon at surface with many fine roots | 22 | -- | 12.5 | 270 | 39 | 62 | 260 | 1100 | 1800 | 520 | Dow |
| RF-112+50-SW110 | 9/22/2006 | 1.9-2.2 | intermediate terrace | 10YR 4/4 dark yellowish brown silty clay, moist, massive, moist, very firm, very plastic | C | CL | 18 | 10 | 7 | 5 | 5 | 15 | 42* | 15* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-112+50-SW15 | 9/22/2006 | 0.0-2.0 | floodplain | 10YR 4/2 dark grayish brown silt loam, few 10YR 4/6 dark yellowish brown mottle, moist, moist, very friable, slightly plastic, common very fine roots, platy, horizontal layering | C1 | ML | 28.1 | 4 | 23 | 13 | 15 | 25 | 79 | 15 | Dow |
| RF-112+50-SW15 | 9/22/2006 | 0.0-2.0 Field Duplicate | floodplain | 10YR 4/2 dark grayish brown silt loam, few 10YR 4/6 dark yellowish brown mottle, moist, moist, very friable, slightly plastic, common very fine roots, platy, horizontal layering | C1 | ML | 26.2 | <4 | 120 | 20 | 29 | 22 | 190 | 28 | Dow |
| RF-112+50-SW15 | 9/22/2006 | 2.0-3.0 | floodplain | N 3/0 very dark gray very fine sandy loam, wet, moist, very friable, slightly plastic, decaying organic matter at 2.1' | 2Cg2 | SM | 26.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-112+50-SW15 | 9/22/2006 | 3.0-3.7 | floodplain | N 3/0 very dark gray silt loam, wet, moist, very friable, slightly plastic, black spots from organic matter | 3Cg3 | ML | 34.5 | <4 | <4 | <4 | <4 | <11 | <27 | <10 | Dow |
| RF-112+50-SW15 | 9/22/2006 | 3.7-4.4 | floodplain | N 3/0 very dark gray loamy fine sand, wet, moist, very friable, Non-plastic, loamy fine sand to fine sandy loam, non-plastic to slightly plastic higher concentration of organic matter at 4.3', freshwater shells | 4Cg4 | -- | 23.1 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RF-112+50-SW35 | 9/22/2006 | 0.0-0.5 | low intermediate terrace | 2.5Y 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, soft, slightly sticky, slightly plastic, many very fine roots, very fine, fine and medium roots | A | SC | 19.2 | 25 | 45 | 25 | 35 | 87 | 220 | 54 | Dow |
| RF-112+50-SW35 | 9/22/2006 | 0.0-0.5 Field Duplicate | low intermediate terrace | 2.5Y 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, soft, slightly sticky, slightly plastic, many very fine roots, very fine, fine and medium roots | A | SC | 18.8 | 23 | 42 | 25 | 47 | 100 | 240 | 58 | Dow |
| RF-112+50-SW35 | 9/22/2006 | 0.5-3.3 | low intermediate terrace | 10YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | C1 | SC | 13.5 | 88 | 160 | 86 | 130 | 300 | 760 | 190 | Dow |
| RF-112+50-SW35 | 9/22/2006 | 3.3-5.5 | low intermediate terrace | 10YR 4/3 brown and 10YR 6/4 light yellowish brow , common 10YR 4/6 dark yellowish brown and 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, very friable, Alternating layers of very fine sandy loam and very fine sand Irregular laminations of organic matter- rich sand Slightly plastic & non-plastic subangular blocky-single grain very friable- loose fine medium and coarse distinct to prominent mottles | 2C2 | SP-SC | 10.7 | <4 | 16 | 8 | 7 | 8 | 39* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-115+00-SW175 | 9/22/2006 | 0.0-0.2 | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, many very fine roots, SC/SM | A | SC | 18.3 | 51 | 65 | 39 | 56 | 150 | 360 | 99 | Dow |
| RF-115+00-SW175 | 9/22/2006 | 0.0-0.2 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, many very fine roots, SC/SM | A | SC | 18 | 54 | 79 | 42 | 57 | 140 | 370 | 100 | Dow |
| RF-115+00-SW175 | 9/22/2006 | 0.2-0.8 Lab Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, moist, very friable, slightly plastic, SC/SM bright orange spot area at 0.3' (7.5YR 5/8) | C | SC | 11.5 | 74 | 79 | 42 | 54 | 150 | 400 | 130 | Dow |
| RF-115+00-SW175 | 9/22/2006 | 0.2-0.8 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, moist, very friable, slightly plastic, SC/SM bright orange spot area at 0.3' (7.5YR 5/8) | C | SC | 11 | 77 | 70 | 40 | 53 | 170 | 410 | 130 | Dow |
| RF-115+00-SW175 | 9/22/2006 | 0.8-2.2 | intermediate terrace | Compacted gravelly clay fill - clay and coarse sand matrix with angular gravel, unsorted, very hard | -- | -- | 5.7 | 37 | 90 | 53 | 53 | 130 | 360 | 84 | Dow |
| RF-115+00-SW5 | 9/22/2006 | 0.0-0.2 Field Duplicate | floodplain | 10YR 4/2 dark grayish brown loamy fine sand, moist, granular, moist, very friable, slightly plastic, common very fine roots, granular to subangular blocky, loose when saturated | A | SP | 37.4 | <4 | 7 | 4 | 6 | 9 | 26* | <10* | Dow |
| RF-115+00-SW5 | 9/22/2006 | 0.0-0.2 | floodplain | 10YR 4/2 dark grayish brown loamy fine sand, moist, granular, moist, very friable, slightly plastic, common very fine roots, granular to subangular blocky, loose when saturated | A | SP | 32.1 | <4 | 6 | 5 | 5 | 11 | 25* | <10* | Dow |
| RF-115+00-SW5 | 9/22/2006 | 0.2-0.6 | floodplain | 10YR 4/3 brown loamy coarse sand, wet, single grain, moist, loose, Non-plastic, very few fine roots | 2C1 | SP | 13.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-115+00-SW5 | 9/22/2006 | 0.6-1.6 | floodplain | 10YR 4/4 dark yellowish brown loamy coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, gravelly loamy coarse sand, rounded, medium, fairly well-sorted gravel | 3C2 | GP-GC | 18.8 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RF-115+00-SW5 | 9/22/2006 | 1.6-2.2 | floodplain | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic | 4C3 | SP | 16.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-115+00-SW50 | 9/22/2006 | 0.0-0.4 Field Duplicate | low intermediate terrace | 2.5Y 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, many very fine roots, very fine and fine roots | A | ML | 23 | 11 | 22 | 11 | 15 | 30 | 89 | 23 | Dow |
| RF-115+00-SW50 | 9/22/2006 | 0.0-0.4 | low intermediate terrace | 2.5Y 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, many very fine roots, very fine and fine roots | A | ML | 22.1 | 8 | 29 | 18 | 18 | 32 | 100 | 22 | Dow |
| RF-115+00-SW50 | 9/22/2006 | 0.4-2.5 | low intermediate terrace | 10YR 4/4 dark yellowish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic | Bw | ML | 19.8 | <4 | <4 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RF-115+00-SW50 | 9/22/2006 | 2.5-3.7 | low intermediate terrace | 10YR 5/3 brown silty clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, angular blocky, moist, friable, moderately plastic, friable to firm, fine distinct mottles | 2C1 | CL | 17.7 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RF-115+00-SW50 | 9/22/2006 | 3.7-5.0 | low intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 4/6 dark yellowish brown and 10YR 3/6 dark yellowish brown mottle, moist, moist, friable, moderately plastic, medium distinct mottles, very fine sandy clay loam, friable to firm | 3C2 | CL | 11.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-115+00-SW50 | 9/22/2006 | 5.0-5.5 | low intermediate terrace | 10YR 5/2 grayish brown silty clay, many 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic, grayish brown matrix with many fine prominent mottles, few dark spots from organic matter | 4C3 | CH | 18.7 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RF-115+05-SW175 | 11/8/2006 | 2.2-4.0 | low terrace | 10YR 3/4 dark yellowish brown sandy clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, Fill material | -- | SM | 9 | 26 | 84 | 38 | 34 | 56 | 240 | 56 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 2.2-4.0 Field Duplicate | low terrace | 10YR 3/4 dark yellowish brown sandy clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, Fill material | -- | SM | 9 | 28 | 56 | 25 | 23 | 55 | 190 | 51 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 4.0-4.7 | low terrace | 10YR 3/4 dark yellowish brown sandy clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, Fill material | -- | SM | 8.1 | 57 | 56 | 29 | <9 | 69 | 210 | 81 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 4.7-6.5 Field Duplicate | low terrace | 10YR 3/3 dark brown clay loam, moist, granular, moist, friable, moderately plastic, common fine roots | Ab | SM | 21 | 92 | 100 | 39 | 72 | 320 | 630 | 170 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 4.7-6.5 | low terrace | 10YR 3/3 dark brown clay loam, moist, granular, moist, friable, moderately plastic, common fine roots | Ab | SM | 20.6 | 70 | 79 | 58 | 54 | 270 | 530 | 130 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 6.5-8.0 Field Duplicate | low terrace | 10Y 5/1 greenish gray clay, common 10YR 5/8 yellowish brown mottle, <15% gravel, moist, massive, moist, very firm, moderately plastic, trace white freshwater shells | C1 | CL | 20.2 | 57 | 50 | 49 | 44 | 320 | 520 | 120 | Alta |
| RF-115+05-SW175 | 11/8/2006 | 6.5-8.0 | low terrace | 10Y 5/1 greenish gray clay, common 10YR 5/8 yellowish brown mottle, <15% gravel, moist, massive, moist, very firm, moderately plastic, trace white freshwater shells | C1 | CL | 21.3 | 40 | 53 | 21 | 41 | 330 | 490 | 100 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-82+00-SW120 | 9/19/2006 | 0.0-1.2 | high terrace | 10YR 3/3 dark brown clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, FILL | -- | SM | 9.1 | <4 | 11 | 4 | 5 | 11 | 30* | <10* | Alta |
| RF-82+00-SW120 | 9/19/2006 | 1.2-2.2 | high terrace | 10YR 3/3 dark brown sandy loam, dry, single grain, dry, loose, slightly plastic, few fine roots, 10YR 4/2, dark grayish brown, <3" layers, clay loam, CL, massive, moderately plastic, very firm | C1 | SW | 5.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW120 | 9/19/2006 | 2.2-3.2 | high terrace | 10YR 3/3 dark brown sandy loam, dry, single grain, dry, loose, slightly plastic, few fine roots, 10YR 4/2, dark grayish brown, <3" layers, clay loam, CL, massive, moderately plastic, very firm | C1 | SW | 2.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW120 | 9/19/2006 | 3.2-4.4 | high terrace | 10YR 3/3 dark brown sandy loam, dry, single grain, dry, loose, slightly plastic, few fine roots, 10YR 4/2, dark grayish brown, <3" layers, clay loam, CL, massive, moderately plastic, very firm | C1 | SW | 2.7 | <4 | <4 | <4 | <4 | 7 | <20* | <10* | Alta |
| RF-82+00-SW120 | 9/19/2006 | 4.4-5.1 | high terrace | 2.5Y 4/2 dark grayish brown clay loam, common 7.5YR 6/8 reddish yellow mottle, <15% gravel, moist, massive, moist, very firm, moderately plastic, concretions, 2" @ 5'- 10YR 4/4, sandy loam, SM, dry single grain, slightly plastic, loose, mottles- 'and' 7.5YR 4/6, common, fine/medium 2.5Y 8/6 yellow deposits @ 6.2' | C2 | CL | 15.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW120 | 9/19/2006 | 5.1-6.5 | high terrace | 2.5Y 4/2 dark grayish brown clay loam, common 7.5YR 6/8 reddish yellow mottle, <15% gravel, moist, massive, moist, very firm, moderately plastic, concretions, 2" @ 5'- 10YR 4/4, sandy loam, SM, dry single grain, slightly plastic, loose, mottles- 'and' 7.5YR 4/6, common, fine/medium 2.5Y 8/6 yellow deposits @ 6.2' | C2 | CL | 14.3 | 330 | 670 | 520 | 380 | 2500 | 4400 | 850 | Alta |
| RF-82+00-SW185 | 9/19/2006 | 0.0-1.1 | intermediate terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, slag and gravel fill, refusal @ 1.1' for 3 holes | -- | SM | 11.5 | 110 | 73 | 48 | 70 | 310 | 600 | 180 | Alta |
| RF-82+00-SW25 | 9/20/2006 | 0.0-1.4 | natural levee | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 12.3 | 65 | 94 | 40 | 73 | 360 | 630 | 150 | Alta |
| RF-82+00-SW25 | 9/20/2006 | 1.4-2.7 | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, single grain, moist, friable, slightly plastic, common fine roots | C1 | SM | 4.3 | <4 | 6 | <4 | 6 | 29 | 41* | <10* | Alta |
| RF-82+00-SW25 | 9/20/2006 | 2.7-4.5 | natural levee | 10YR 6/4 light yellowish brow fine sand, common 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, few medium roots | C2 | SP | 6.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW25 | 9/20/2006 | 4.5-5.7 | natural levee | 10YR 6/4 light yellowish brow fine sand, many 10YR 5/8 yellowish brown mottle, <15% gravel, dry, single grain, dry, loose, Non-plastic, BLACK DEPOSITS @ 5.3' (MANGANESE?) | C3 | SP | 7.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW25 | 9/20/2006 | 5.7-6.6 | natural levee | 10YR 6/1 gray fine sand, 15-35% gravel, dry, single grain, dry, loose, Non-plastic, GRAVEL 0.1-0.5 cm, SUBROUNDED | C4 | SP | 9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

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"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.

1/31/2007

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-82+00-SW50 | 9/19/2006 | 0.0-0.5 | low intermediate terrace | 10YR 3/3 dark brown loam, dry, granular, structureless, moist, friable, moderately plastic, common fine roots | A | SM | 12.1 | 110 | 26 | 21 | 41 | 180 | 380 | 160 | Alta |
| RF-82+00-SW50 | 9/19/2006 | 0.5-1.2 | low intermediate terrace | 10YR 3/4 dark yellowish brown, dry, granular, structureless, dry, loose, slightly plastic, few fine roots | -- | SM | 7.9 | 23 | 18 | 8 | 14 | 71 | 130 | 40 | Alta |
| RF-82+00-SW50 | 9/19/2006 | 1.2-2.0 | low intermediate terrace | | -- | -- | 3.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW50 | 9/19/2006 | 2.0-3.5 | low intermediate terrace | | -- | -- | 3.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW50 | 9/19/2006 | 3.5-4.0 | low intermediate terrace | | -- | -- | 6.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+00-SW55 | 9/19/2006 | 0.0-1.1 | low terrace | 10YR 4/4 dark yellowish brown loam, dry, granular, structureless, moist, friable, GRAVEL FILL AT 0.8 FT, >20% VOLUME, REFUSAL ON TWO BORINGS | -- | SM | 6.1 | 5 | 19 | 8 | 9 | 29 | 69 | 14 | Alta |
| RF-82+05-SW120 | 11/13/2006 | 6.5-7.3 | high terrace | 2.5Y 4/1 dark gray sandy loam, moist, granular, moist, friable, slightly plastic, 7.2" - layer of 10YR 4/4, sand, includes few fine gravel | 2C | SM | 17.9 | 52 | 320 | 160 | 150 | 740 | 1400 | 230 | Alta |
| RF-82+05-SW120 | 11/13/2006 | 7.3-8.3 | high terrace | 2.5Y 4/1 dark gray sandy clay loam, <15% gravel, moist, angular blocky, moist, very firm, very plastic, very few fine gravel, few coarse sand | 3C | CL | 10.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+05-SW120 | 11/13/2006 | 8.3-9.3 | high terrace | 2.5Y 4/1 dark gray sandy clay loam, <15% gravel, moist, angular blocky, moist, very firm, very plastic, very few fine gravel, few coarse sand | 3C | CL | 10.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-82+05-SW185 | 11/14/2006 | 1.1-2.5 | intermediate terrace | 10YR 3/3 dark brown sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, slag and gravel fill | -- | CL | 10.1 | 170 | 520 | 250 | 600 | 1900 | 3500 | 660 | Alta |
| RF-82+05-SW185 | 11/14/2006 | 2.5-3.9 | intermediate terrace | 10YR 3/3 dark brown sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, slag and gravel fill | -- | CL | 10.2 | 38 | 180 | 150 | 320 | 1200 | 1800 | 300 | Alta |
| RF-82+05-SW185 | 11/14/2006 | 3.9-5.4 Field Duplicate Lab Duplicate | intermediate terrace | 10YR 5/6 yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin layers of silty clay loam at 4.5' and 5.1'. | C1 | SP | 9 | <4 | 9 | 4 | 9 | 28 | 50* | <10* | Alta |
| RF-82+05-SW185 | 11/14/2006 | 3.9-5.4 | intermediate terrace | 10YR 5/6 yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin layers of silty clay loam at 4.5' and 5.1'. | C1 | SP | 9.9 | <4 | 6 | <4 | 5 | 20 | 32* | <10* | Alta |
| RF-82+05-SW185 | 11/14/2006 | 3.9-5.4 Field Duplicate | intermediate terrace | 10YR 5/6 yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin layers of silty clay loam at 4.5' and 5.1'. | C1 | SP | 9 | <4 | 7 | <4 | 5 | 19 | 31* | <10* | Alta |
| RF-82+05-SW185 | 11/14/2006 | 5.4-6.3 | intermediate terrace | 2.5Y 6/2 light brownish gray very fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 12.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+05-SW185 | 11/14/2006 | 5.4-6.3 Field Duplicate | intermediate terrace | 2.5Y 6/2 light brownish gray very fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 12.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-82+05-SW185 | 11/14/2006 | 5.4-6.3 Field Duplicate Lab Duplicate | intermediate terrace | 2.5Y 6/2 light brownish gray very fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 12.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-IC-C | 9/25/2006 | 0.0-0.1 | in-channel | 10YR 5/2 grayish brown , wet, single grain, Non-plastic, Non-cohesive, subrounded and subangular grains, very few coarse sand, well sorted. | 1 | SP | 7.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-IC-C | 9/25/2006 | 0.1-0.5 | in-channel | 10YR 4/2 dark grayish brown , wet, single grain, Non-plastic, Non-cohesive, subrounded grains, few coarse sand, very few shell fragments, somewhat well sorted. | 2 | SP | 11.3 | <4 | 7 | <4 | <4 | 8 | <20* | <10* | Alta |
| RF-86+00-IC-C | 9/25/2006 | 0.5-0.7 | in-channel | 10YR 4/1 dark gray , wet, single grain, Non-plastic, Loose, non-cohesive, subrounded grains, common medium and coarse sand, poorly sorted, fine to medium gravel. | 3 | SW | 11 | <4 | 6 | <4 | <4 | <4 | <20* | <10* | Alta |
| RF-86+00-IC-C | 9/25/2006 | 0.7-1.0 | in-channel | 10YR 2/1 black , wet, single grain, Non-plastic, Loose, non-cohesive, subrounded grains, common coarse sand, poorly sorted, fine to medium gravel. | 3 | SW | 8.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-86+00-IC-NE | 9/24/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown , wet, single grain, Non-plastic, Non-cohesive, very few coarse sand, well sorted. | 1 | SP | 5.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-IC-NE | 9/24/2006 | 0.5-1.4 | in-channel | 10YR 3/1 very dark gray , wet, single grain, Non-plastic, Non-cohesive, subrounded grains, very few coarse sand, very few fine gravel. | 2 | SM | 15.3 | <4 | <4 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RF-86+00-IC-NE | 9/24/2006 | 0.5-1.4 Field Duplicate | in-channel | 10YR 3/1 very dark gray , wet, single grain, Non-plastic, Non-cohesive, subrounded grains, very few coarse sand, very few fine gravel. | 2 | SM | 16.2 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RF-86+00-SW15 | 9/21/2006 | 0.0-0.4 | low intermediate terrace | 10YR 3/3 dark brown loam, dry, granular, moderate, dry, slightly hard, moderately plastic, common fine roots | AC | SM | 13.4 | <4 | 10 | 5 | 5 | 14 | 34* | <10 * | Alta |
| RF-86+00-SW15 | 9/21/2006 | 0.4-1.1 | low intermediate terrace | 10YR 3/4 dark yellowish brown loam, dry, granular, dry, slightly hard, moderately plastic, common fine roots, Occasional layers of loamy sand <1 in., common roots to 3' then few. | C1 | SM | 7.9 | <4 | 11 | 4 | 6 | 17 | 38* | <10 * | Alta |
| RF-86+00-SW15 | 9/21/2006 | 1.1-2.1 | low intermediate terrace | 10YR 3/4 dark yellowish brown loam, dry, granular, dry, slightly hard, moderately plastic, common fine roots, Occasional layers of loamy sand <1 in., common roots to 3' then few. | C1 | SM | 7.9 | 22 | 27 | 10 | 13 | 54 | 130 | 38 | Alta |
| RF-86+00-SW15 | 9/21/2006 | 2.1-2.7 | low intermediate terrace | 10YR 3/4 dark yellowish brown loam, dry, granular, dry, slightly hard, moderately plastic, common fine roots, Occasional layers of loamy sand <1 in., common roots to 3' then few. | C1 | SM | 8.9 | 4 | 19 | 12 | 11 | 36 | 82 | 15 | Alta |
| RF-86+00-SW15 | 9/21/2006 | 2.7-3.1 | low intermediate terrace | 10YR 3/4 dark yellowish brown sandy clay loam, few 2.5YR 3/6 dark red mottle, dry, subangular blocky, dry, moderately hard, moderately plastic, common fine roots, Dry to 4.6', common roots to 3' then few, layer of wood fragments at 4' (0.5"). | C2 | ML/CL | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-SW15 | 9/21/2006 | 3.1-5.1 | low intermediate terrace | 10YR 3/4 dark yellowish brown sandy clay loam, few 2.5YR 3/6 dark red mottle, dry, subangular blocky, dry, moderately hard, moderately plastic, common fine roots, Dry to 4.6', common roots to 3' then few, layer of wood fragments at 4' (0.5"). | C2 | ML/CL | 11.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-SW180 | 9/20/2006 | 0.0-1.4 | intermediate terrace | 10YR 3/2 very dark grayish br loam, dry, granular, moist, friable, moderately plastic, common fine roots | A | SM | 11 | 64 | 60 | 29 | 63 | 300 | 510 | 130 | Alta |
| RF-86+00-SW180 | 9/20/2006 | 1.4-3.0 | intermediate terrace | 10YR 5/4 yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, dry, single grain, moist, friable, slightly plastic, common fine roots, WHITE FRESHWATER SHELLS, <1%, <0.5 cm | C1 | SW | 7.5 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RF-86+00-SW180 | 9/20/2006 | 3.0-5.3 | intermediate terrace | 10YR 5/6 yellowish brown sand, 15-35% gravel, dry, single grain, dry, loose, Non-plastic | C2 | SP | 3.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-86+00-SW260 | 9/20/2006 | 0.0-2.2 | low intermediate terrace | 10YR 4/4 dark yellowish brown sandy loam, dry, granular, dry, moderately hard, moderately plastic, common roots | -- | -- | 5.8 | <4 | 4 | <4 | <4 | 10 | <20 * | <10 * | Alta |
| RF-86+00-SW260 | 9/20/2006 | 2.2-3.2 | low intermediate terrace | 10YR 6/3 pale brown, dry, single grain, dry, loose, Non-plastic, Gravel at 4.2', subrounded, pepper sized <1 mm diameter black grains throughout 3.2' to 5.2'. | C | SP | 4.2 | <4 | 13 | 5 | 5 | 13 | 37* | <10 * | Alta |
| RF-86+00-SW260 | 9/20/2006 | 3.2-4.2 | low intermediate terrace | 10YR 6/3 pale brown, dry, single grain, dry, loose, Non-plastic, Gravel at 4.2', subrounded, pepper sized <1 mm diameter black grains throughout 3.2' to 5.2'. | C | SP | 3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-SW260 | 9/20/2006 | 4.2-5.2 | low intermediate terrace | 10YR 6/3 pale brown, dry, single grain, dry, loose, Non-plastic, Gravel at 4.2', subrounded, pepper sized <1 mm diameter black grains throughout 3.2' to 5.2'. | C | SP | 5.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-86+00-SW320 | 9/20/2006 | 0.0-1.1 | intermediate terrace | 10YR 4/3 brown sandy loam, 15<35% gravel, dry, granular, dry, moderately hard, slightly plastic, common fine roots, Refusal at 2.2', subangular gravel. | -- | -- | 8.1 | <4 | 11 | 5 | 7 | 28 | 51 | <10 * | Alta |
| RF-86+00-SW320 | 9/20/2006 | 1.1-2.2 | intermediate terrace | 10YR 4/3 brown sandy loam, 15<35% gravel, dry, granular, dry, moderately hard, slightly plastic, common fine roots, Refusal at 2.2', subangular gravel. | -- | -- | 5.9 | 48 | 23 | 15 | 17 | 91 | 190 | 72 | Alta |
| RF-86+00-SW80 | 9/20/2006 | 0.0-1.2 | low terrace | 10YR 5/4 yellowish brown loamy sand, common 5YR 4/6 yellowish red mottle, dry, granular, dry, slightly hard, slightly plastic, common fine roots, Subangular | -- | -- | 12.8 | <4 | 7 | 4 | 6 | 18 | 35* | <10 * | Alta |
| RF-86+00-SW80 | 9/20/2006 | 1.2-2.3 | low terrace | 2.5Y 5/2 grayish brown and 2.5Y 5/2 grayish brown loamy sand, few 7.5YR 5/8 strong brown mottle, moist, granular, strong, moist, friable, slightly plastic, few roots, Medium mottles. | C | SW | 9.7 | 11 | 7 | <4 | 5 | 20 | 42* | 17* | Alta |
| RF-86+00-SW80 | 9/20/2006 | 2.3-4.5 | low terrace | 2.5Y 5/2 grayish brown and 2.5Y 5/2 grayish brown loamy sand, few 7.5YR 5/8 strong brown mottle, moist, granular, strong, moist, friable, slightly plastic, few roots, Medium mottles. | C | SW | 11.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-89+00-SW100 | 11/3/2006 | 0.0-1.1 | low intermediate terrace | 10YR 3/2 very dark grayish br and 10YR 4/6 dark yellowish brown sandy loam, <15% gravel, moist, granular, moist, friable, slightly plastic, common fine roots, 0.1' of 10YR 3/2 loam followed by 10 YR 4/6 gravelly sand fill | -- | SM | 15.9 | <4 | 10 | 10 | 38 | 310 | 360 | 50 | Dow |
| RF-90+50-IC-C | 9/27/2006 | 0.0-0.8 | in-channel | 10YR 4/2 dark grayish brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, sand and gravel, noncohesive, subrounded grains, subangular gravel, few shell fragments, poorly sorted | 1 | SW | 7.9 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RF-90+50-IC-C | 9/27/2006 | 0.8-1.3 | in-channel | 10YR 3/1 very dark gray silt loam, <15% gravel, wet, granular, moist, friable, slightly plastic, fine granular structure, cohesive, few fine sand, few shell fragments | 2 | ML | 27.9 | <4 | <5 LISR | <4 | <4 | <7 | <24 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-90+50-IC-NE | 9/27/2006 | 0.0-0.4 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, common coarse sand, sommon medium sand, poorly sorted gravel | 1 | SW | 20.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-IC-NE | 9/27/2006 | 0.4-0.6 | in-channel | 10YR 4/1 dark gray and 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, common fine roots, noncohesive, subrounded grains, fine and medium roots | 2 | SM | 30.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-IC-NE | 9/27/2006 | 0.6-1.2 | in-channel | 10YR 2/1 black loamy sand, moist, single grain, moist, loose, Non-plastic, few fine roots, noncohesive, subrounded grains, common coarse sand, few shell fragments, somewhat poorly sorted | 3 | SW | 20.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-IC-NE | 9/27/2006 | 1.2-1.5 | in-channel | N 2/0 black loamy fine sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded and subangular grains, greasy appearance, few coarse sand, somewhat poorly sorted | 4 | SW | 28.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-IC-SW | 10/3/2006 | 0.0-0.1 | in-channel | 10YR 4/2 dark grayish brown very fine sandy loam, many 7.5YR 4/6 strong brown mottle, <15% gravel, wet, granular, moist, friable, slightly plastic, very few very fine roots, cohesive, very few coarse sand and gravel | 1 | SM | 20.5 | <4 | <5 LISR | <7 LISR | <4 | <4 | <24 | <10 | Dow |
| RF-90+50-IC-SW | 10/3/2006 | 0.1-1.2 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, granular, moist, friable, slightly plastic, very few very fine roots, and very fine sandy loam, fine granular structure, cohesive, very fine and fine roots, distinct layers, few medium sand | 2 | SM | 27.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-IC-SW | 10/3/2006 | 0.1-1.2 Field Duplicate | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, granular, moist, friable, slightly plastic, very few very fine roots, and very fine sandy loam, fine granular structure, cohesive, very fine and fine roots, distinct layers, few medium sand | 2 | SM | 27.3 | <4 | <4 | <4 | <5 | <8 | <25 | <10 | Dow |
| RF-90+50-IC-SW | 10/3/2006 | 1.2-1.8 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, very few shell fragments | 3 | SM | 21.6 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| | | | | | | | | | | | | | | | |
| RF-90+50-SW10 | 9/22/2006 | 0.0-1.1 | floodplain | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots, layers of well graded sand of <0.2' thick | C1 | SM | 12.8 | 14 | 26 | 17 | 22 | 74 | 150 | 34 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 1.1-2.2 | floodplain | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots, layers of well graded sand of <0.2' thick | C1 | SM | 15.8 | 55 | 34 | 26 | 32 | 77 | 220 | 84 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 2.2-2.7 | floodplain | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots, layers of well graded sand of <0.2' thick | C1 | SM | 19.3 | 46 | 55 | 38 | 40 | 86 | 260 | 80 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 2.7-3.3 | floodplain | 10YR 4/3 brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, Wet at 4.4', black glassy flakes from 3.0-3.4, <2mm | C2 | CL | 25.2 | 57 | 83 | 44 | 83 | 150 | 410 | 120 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 3.3-4.4 | floodplain | 10YR 4/3 brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, Wet at 4.4', black glassy flakes from 3.0-3.4, <2mm | C2 | CL | 21.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 4.4-5.5 | floodplain | 10YR 4/3 brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, Wet at 4.4', black glassy flakes from 3.0-3.4, <2mm | C2 | CL | 21.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-90+50-SW10 | 9/22/2006 | 4.4-5.5 Field Duplicate | floodplain | 10YR 4/3 brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, Wet at 4.4', black glassy flakes from 3.0-3.4, <2mm | C2 | CL | 22.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RF-90+50-SW150 | 9/21/2006 | 0.0-1.4 | low terrace | 10YR 3/3 dark brown loam, <15% gravel, moist, granular, moist, friable, moderately plastic, common fine roots, iron stains at 1.0', subangular rock fragments at 1.2', >1cm diameter (fill) | A1 | CL | 12 | 36 | 26 | 15 | 21 | 75 | 170 | 58 | Alta |
| RF-90+50-SW150 | 9/21/2006 | 1.4-2.2 | low terrace | 10YR 5/4 yellowish brown loamy sand, 15-35% gravel, dry, single grain, dry, loose, slightly plastic, fewroots, subangular and subrounded fill < 1cm diameter | C1 | SW | 6.8 | 29 | 10 | 6 | 8 | 32 | 85 | 40 | Alta |
| RF-90+50-SW150 | 9/21/2006 | 2.2-3.2 | low terrace | 10YR 4/2 dark grayish brown clay, few 10YR 5/8 yellowish brown mottle, moist, massive, moist, very firm, moderately plastic, fine mottles | C2 | ML/CL | 11.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-SW220 | 9/21/2006 | 0.0-0.9 | low intermediate terrace | 10YR 3/2 very dark grayish br loam, <15% gravel, dry, subangular blocky, dry, moderately hard, moderately plastic, common fine roots, Fill, angular gravel | -- | SM | 12.3 | 12 | 41 | 36 | 34 | 200 | 330 | 52 | Alta |
| RF-90+50-SW220 | 9/21/2006 | 0.9-2.1 | low intermediate terrace | 10YR 6/4 light yellowish brow sand, few 10YR 4/6 dark yellowish brown mottle, dry, single grain, dry, loose, Non-plastic, medium mottles (iron deposits) | E | SP | 7.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-SW220 | 9/21/2006 | 2.1-3.2 | low intermediate terrace | 10YR 4/2 dark grayish brown and 10Y 5/1 greenish gray clay, few 10YR 5/8 yellowish brown mottle, moist, massive, moist, firm, moderately plastic, fine mottles, secondary color at 2.5' | C1 | CL | 10.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-90+50-SW25 | 9/22/2006 | 0.0-0.5 Field Dup / Lab Dup | natural levee | 10YR 4/2 dark grayish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots | A | SM | 10.5 | <4 | <4 | <4 | <7 | 6 | <20 * | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 0.0-0.5 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots | A | SM | 11.5 | <4 | <4 | <4 | <5 | 6 | <20 * | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 0.0-0.5 | natural levee | 10YR 4/2 dark grayish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots | A | SM | 11.6 | <4 | 4 | <4 | 4 | 8 | <20 * | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 0.5-2.2 | natural levee | 10YR 4/3 brown and 10YR 5/4 yellowish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots, common roots to 4', then few, poorly graded sand layers (secondary color) at <0.2' thick | C1 | SM | 8.5 | <4 | 6 | <4 | 4 | 11 | 21* | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 2.2-3.3 | natural levee | 10YR 4/3 brown and 10YR 5/4 yellowish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots, common roots to 4', then few, poorly graded sand layers (secondary color) at <0.2' thick | C1 | SM | 7.1 | <4 | 9 | 5 | 7 | 28 | 50* | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 3.3-4.4 | natural levee | 10YR 4/3 brown and 10YR 5/4 yellowish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots, common roots to 4', then few, poorly graded sand layers (secondary color) at <0.2' thick | C1 | SM | 8.4 | 18 | 24 | 16 | 17 | 65 | 140 | 36 | Dow |
| RF-90+50-SW25 | 9/22/2006 | 4.4-5.5 | natural levee | 10YR 4/3 brown and 10YR 5/4 yellowish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots, common roots to 4', then few, poorly graded sand layers (secondary color) at <0.2' thick | C1 | SM | 20.2 | 80 | 39 | 23 | 39 | 110 | 300 | 120 | Dow |
| RF-90+50-SW25 | 9/22/2006 | 5.5-6.4 | natural levee | 10YR 4/3 brown and 10YR 5/4 yellowish brown sandy loam, dry, granular, dry, soft, slightly plastic, commonroots, common roots to 4', then few, poorly graded sand layers (secondary color) at <0.2' thick | C1 | SM | 20.4 | 40 | 27 | 12 | 31 | 71 | 180 | 66 | Dow |
| RF-90+50-SW25 | 9/22/2006 | 6.4-7.7 | natural levee | 10YR 3/3 dark brown clay loam, common 7.5YR 5/4 brown mottle, moist, subangular blocky, moist, firm, moderately plastic, wet at 7.0' Black shiny flakes at 6.5-6.6', <2mm diameter | C2 | ML/CL | 19.5 | <4 | 8 | 5 | 7 | 13 | 32* | <10 * | Dow |
| RF-90+50-SW25 | 9/22/2006 | 7.7-8.8 | natural levee | 10YR 3/3 dark brown clay loam, common 7.5YR 5/4 brown mottle, moist, subangular blocky, moist, firm, moderately plastic, wet at 7.0' Black shiny flakes at 6.5-6.6', <2mm diameter | C2 | ML/CL | 20.6 | <4 | <5 | <4 | <4 | <8 | <25 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-90+50-SW260 | 9/21/2006 | 0.0-1.8 | intermediate terrace | 10YR 3/2 very dark grayish br clay loam, few 10YR 6/8 brownish yellow mottle, 15<35% gravel, dry, subangular blocky, dry, hard, moderately plastic, few fine roots, gravelly loam/clay loam, subangular blocky/granular, angular rock fragments 0.1-1.0 cm diameter, fine to medium mottles | 1 | -- | 8.5 | 47 | 36 | 28 | 26 | 140 | 280 | 81 | Alta |
| RF-90+50-SW260 | 9/21/2006 | 1.8-2.1 | intermediate terrace | 10YR 3/3 dark brown and 10YR 6/6 brownish yellow loamy sand, dry, granular, dry, loose, slightly plastic, fewroots, Secondary color - fine sand, SP at 3.0' with 2.5Y 4/2 dark grayish brown layer 2.6-2.8' (ML/CL) | C | SW | 2.6 | <4 | <4 | <4 | <4 | 16 | <20 * | <10 * | Alta |
| RF-90+50-SW260 | 9/21/2006 | 2.1-3.2 | intermediate terrace | 10YR 3/3 dark brown and 10YR 6/6 brownish yellow loamy sand, dry, granular, dry, loose, slightly plastic, fewroots, Secondary color - fine sand, SP at 3.0' with 2.5Y 4/2 dark grayish brown layer 2.6-2.8' (ML/CL) | C | SW | 5.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-SW45 | 9/22/2006 | 0.0-0.6 | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, commonroots | A | SM | 21 | <4 | 13 | 5 | 9 | 17 | 43* | <10 * | Dow |
| RF-90+50-SW45 | 9/22/2006 | 0.0-0.6 Field Duplicate | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, commonroots | A | SM | 22.2 | <4 | 13 | 6 | 10 | 17 | 46* | <10 * | Dow |
| RF-90+50-SW45 | 9/22/2006 | 0.6-1.1 | low terrace | 10YR 3/4 dark yellowish brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, commonroots | C1 | SM | 10.4 | <4 | 15 | 8 | 15 | 49 | 87 | 15 | Dow |
| RF-90+50-SW45 | 9/22/2006 | 1.1-2.7 | low terrace | 10YR 3/4 dark yellowish brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, commonroots | C1 | SM | 13.1 | 27 | 27 | 13 | 24 | 73 | 160 | 49 | Dow |
| RF-90+50-SW45 | 9/22/2006 | 2.7-3.3 | low terrace | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow clay loam, few 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, few to common mottles, fine to medium Secondary color - fine sand, SP, 2.9-3.1' Wood Fragments at 4.0' | C2 | ML/CL | 20 | 36 | 87 | 49 | 63 | 130 | 360 | 86 | Dow |
| RF-90+50-SW45 | 9/22/2006 | 3.3-4.4 | low terrace | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow clay loam, few 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic, fewroots, few to common mottles, fine to medium Secondary color - fine sand, SP, 2.9-3.1' Wood Fragments at 4.0' | C2 | ML/CL | 19.1 | 13 | 26 | 60 | <14 | 28 | 130 | 25 | Dow |
| RF-90+50-SW45 | 9/22/2006 | 4.4-5.5 | low terrace | 10YR 4/2 dark grayish brown clay loam, <15% gravel, moist, massive, moist, very firm, moderately plastic, fewroots, Wet at 4.9', subrounded rock fragments, gravelly clay | C3 | CL | 7.9 | <4 | <5 | <4 | <4 | <7 | <24 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-90+50-SW75 | 9/21/2006 | 0.0-0.7 | low intermediate terrace | 10YR 3/2 very dark grayish br loam, dry, granular, dry, slightly hard, moderately plastic, common roots | A | SM | 12.9 | <4 | 19 | 9 | 10 | 32 | 70 | 12 | Alta |
| RF-90+50-SW75 | 9/21/2006 | 0.7-1.9 | low intermediate terrace | 10YR 5/4 yellowish brown sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, common roots, Iron staining from 1.6-1.8', 10YR 5/8, strong brown, subrounded gravel, <1cm diameter | E | SP | 2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-SW75 | 9/21/2006 | 1.9-2.6 | low intermediate terrace | 10YR 5/4 yellowish brown clay loam, common 10YR 6/8 brownish yellow mottle, dry, subangular blocky, dry, moderately hard, medium mottles | B | ML/CL | 7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-90+50-SW75 | 9/21/2006 | 2.6-4.1 | low intermediate terrace | 2.5Y 4/3 olive brown clay loam, moist, massive, moist, firm, wet at 4.3' sand layer at 4.0-4.1' - SW | C1 | CL | 10.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-98+00-SW15 | 9/25/2006 | 0.0-1.7 | floodplain | 10YR 3/3 dark brown and 10YR 5/4 yellowish brown loam, moist, granular, moist, friable, moderately plastic, common fine roots | AC | ML/CL | 16.5 | 75 | 12 | 30 | 39 | 97 | 250 | 110 | Alta |
| RF-98+00-SW15 | 9/25/2006 | 1.7-2.4 | floodplain | 10YR 4/4 dark yellowish brown loam, common 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 3.3' medium mottles Field Duplicate 2.4-3.5' | C | SM | 15.2 | 6 | <4 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RF-98+00-SW15 | 9/25/2006 | 2.4-3.5 | floodplain | 10YR 4/4 dark yellowish brown loam, common 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 3.3' medium mottles Field Duplicate 2.4-3.5' | C | SM | 17.2 | 4 | 9 | 4 | 4 | 7 | 28* | <10 * | Alta |
| RF-98+00-SW15 | 9/25/2006 | 2.4-3.5 Field Duplicate | floodplain | 10YR 4/4 dark yellowish brown loam, common 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 3.3' medium mottles Field Duplicate 2.4-3.5' | C | SM | 17.9 | 7 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RF-98+00-SW210 | 9/22/2006 | 0.0-1.0 Field Duplicate | low terrace | 10YR 3/3 dark brown loam, <15% gravel, moist, subangular blocky, moist, friable, moderately plastic, common roots, FILL Angular rock fragments | -- | SM | 12.6 | 14 | 17 | 10 | 24 | 83 | 150 | 34 | Dow |
| RF-98+00-SW210 | 9/22/2006 | 0.0-1.0 | low terrace | 10YR 3/3 dark brown loam, <15% gravel, moist, subangular blocky, moist, friable, moderately plastic, common roots, FILL Angular rock fragments | -- | SM | 8.4 | 39 | 9 | 4 | 9 | 30 | 90 | 50 | Dow |
| RF-98+00-SW210 | 9/22/2006 | 1.0-2.0 | low terrace | 10YR 3/4 dark yellowish brown loam, <15% cobble, moist, subangular blocky, moist, friable, moderately plastic, few roots, FILL- REFUSAL angular rocks | -- | SM | 6.1 | 15 | 34 | 24 | 25 | 74 | 170 | 37 | Dow |

NOTES:

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-98+00-SW30 | 9/25/2006 | 0.0-1.0 | natural levee | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 16.6 | <4 | <9 | 5 | 5 | 16 | 26* | <10* | Alta |
| RF-98+00-SW30 | 9/25/2006 | 1.0-2.3 | natural levee | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few roots, trace of freshwater shells, <1mm | C1 | SP | 2.8 | 14 | 10 | 5 | 7 | 31 | 67 | 22 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 2.3-3.2 | natural levee | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few roots, trace of freshwater shells, <1mm | C1 | SP | 6.3 | 26 | 13 | 7 | 9 | 34 | 88 | 37 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 3.2-3.6 | natural levee | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few roots, trace of freshwater shells, <1mm | C1 | SP | 9.7 | 27 | 26 | 16 | 14 | 63 | 150 | 45 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 3.6-4.6 | natural levee | 10YR 3/4 dark yellowish brown and 10YR 5/4 yellowish brown loam, moist, single grain, moist, friable, moderately plastic, Secondary color - occasional layers of less than 0.1" thick, brown sand, SP, nonplastic | C2 | SM | 16.2 | 180 | 76 | 30 | 47 | 130 | 460 | 230 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 4.6-5.5 | natural levee | 10YR 4/4 dark yellowish brown loam, common 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, medium mottles, trace of freshwater shells below 5.0', <1.0mm Field Duplicate 5.5-6.6' | C3 | ML/CL | 19.7 | 86 | 18 | 15 | 19 | 69 | 210 | 110 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 5.5-6.6 | natural levee | 10YR 4/4 dark yellowish brown loam, common 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, medium mottles, trace of freshwater shells below 5.0', <1.0mm Field Duplicate 5.5-6.6' | C3 | ML/CL | 21.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RF-98+00-SW30 | 9/25/2006 | 5.5-6.6 Field Duplicate | natural levee | 10YR 4/4 dark yellowish brown loam, common 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, medium mottles, trace of freshwater shells below 5.0', <1.0mm Field Duplicate 5.5-6.6' | C3 | ML/CL | 21.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-98+00-SW50 | 9/25/2006 | 0.0-0.6 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field Duplicate | A | SM | 22.8 | 8 | <4 | 17 | 17 | 60 | 100 | 22 | Alta |
| RF-98+00-SW50 | 9/25/2006 | 0.0-0.6 Field Duplicate | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field Duplicate | A | SM | 23.5 | 4 | 45 | 21 | 20 | 53 | 140 | 23 | Alta |
| RF-98+00-SW50 | 9/25/2006 | 0.6-2.4 | wetland | 10YR 4/2 dark grayish brown loam, common 7.5YR 4/4 brown mottle, moist, granular, moist, friable, common fine roots, granular/subangular blocky, root common to 3.0' then few, medium mottles Occasional layers <0.1' of 10YR 5/4 yellowish brown sand, SP, dry, single grain, nonplastic, loose | C1 | SM | 16.9 | 100 | 41 | 21 | 24 | 93 | 280 | 130 | Alta |
| RF-98+00-SW50 | 9/25/2006 | 2.4-3.1 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 4.4' granular/subangular blocky, fine to medium mottles, freshwater shells below 3.5', <2mm, 10% volume (trace) | C2 | ML/CL | 20.6 | 39 | 20 | 14 | 15 | 57 | 140 | 57 | Alta |
| RF-98+00-SW50 | 9/25/2006 | 3.1-4.2 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 4.4' granular/subangular blocky, fine to medium mottles, freshwater shells below 3.5', <2mm, 10% volume (trace) | C2 | ML/CL | 21.3 | <4 | 7 | <4 | 4 | 7 | <20 * | <10 * | Alta |
| RF-98+00-SW50 | 9/25/2006 | 4.2-5.1 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, granular, moist, friable, moderately plastic, few roots, wet at 4.4' granular/subangular blocky, fine to medium mottles, freshwater shells below 3.5', <2mm, 10% volume (trace) | C2 | ML/CL | 21.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach F

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RF-98+00-SW80 | 9/22/2006 | 0.0-0.5 | low terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 18.7 | <4 | 12 | 7 | 10 | 27 | 56 | <10 * | Dow |
| RF-98+00-SW80 | 9/22/2006 | 0.5-1.2 | low terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, firm, moderately plastic, common roots, Occasional layers of loamy sand and silty sand | C1 | SM | 13.1 | 17 | 26 | 12 | 16 | 48 | 120 | 32 | Dow |
| RF-98+00-SW80 | 9/22/2006 | 1.2-2.4 | low terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, firm, moderately plastic, common roots, Occasional layers of loamy sand and silty sand | C1 | SM | 11.4 | 70 | 27 | 15 | 23 | 80 | 220 | 97 | Dow |
| RF-98+00-SW80 | 9/22/2006 | 2.4-3.5 Lab Duplicate | low terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, firm, moderately plastic, common roots, Occasional layers of loamy sand and silty sand | C1 | SM | 18 | 45 | 24 | 16 | 29 | 79 | 190 | 71 | Dow |
| RF-98+00-SW80 | 9/22/2006 | 2.4-3.5 | low terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, firm, moderately plastic, common roots, Occasional layers of loamy sand and silty sand | C1 | SM | 18.8 | 40 | 27 | 16 | 26 | 74 | 180 | 64 | Dow |
| RF-98+00-SW80 | 9/22/2006 | 3.5-4.5 | low terrace | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few roots | C2 | CL | 21.1 | 11 | 8 | 5 | 7 | 21 | 52 | 18 | Dow |
| RF-98+00-SW80 | 9/22/2006 | 4.5-5.6 Field Duplicate | low terrace | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few roots | C2 | CL | 20.7 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RF-98+00-SW80 | 9/22/2006 | 4.5-5.6 | low terrace | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few roots | C2 | CL | 22.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-117+00-IC-C | 10/5/2006 | 0.0-0.2 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 1 | SP | 2.4 | <4 | 19 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RG-117+00-IC-C | 10/5/2006 | 0.2-1.2 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few shell fragments, few coarse sand, fine gravel, very few angular glossy black coarse sand, somewhat well sorted | 2 | SP | 4.2 | <4 | 19 | 5 | 7 | 9 | 40* | <10 * | Dow |
| RG-117+00-IC-C | 10/5/2006 | 1.2-1.6 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, few medium roots, medium sand, noncohesive, subrounded grains, few shell fragments, common coarse sand, few medium to coarse roots/black material with layer at 1.4', somewhat well sorted | 3 | SP | 10 | <4 | 200 | 52 | 57 | 34 | 350 | 49 | Dow |
| RG-117+00-IC-C | 10/5/2006 | 1.6-2.0 | in-channel | 10YR 3/1 very dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium roots, noncohesive, subrounded and subangular grains, fine gravel, few angular glossy black coarse sand, common medium and coarse roots/black material concentrated in a layer at 1.9' | 4 | SW | 12.8 | <4 | 18 | 4 | 6 | 8 | 36* | <10 * | Dow |
| RG-117+00-IC-NE | 10/4/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, fine gravel, very few shell fragments, well sorted | 1 | SP | 3.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-117+00-IC-NE | 10/4/2006 | 0.6-1.5 Field Duplicate | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, subrounded grains, few angular glassy black coarse sand, very few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 4.4 | <4 | 4 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RG-117+00-IC-NE | 10/4/2006 | 0.6-1.5 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, subrounded grains, few angular glassy black coarse sand, very few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 4.8 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RG-117+00-IC-NE | 10/4/2006 | 1.5-2.1 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, common angular glassy black coarse sand, very few needle glossy black material | 3 | SM | 13 | 5 | 310 | 110 | 57 | 120 | 610 | 76 | Alta |
| RG-117+00-IC-NE | 10/4/2006 | 2.1-2.4 | in-channel | 10YR 4/2 dark grayish brown and N 2/0 black loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, many angular glassy black medium and coarse sand, very few needle glossy black material, few shell fragments | 4 | SM | 11.1 | 10 | 72 | 49 | 54 | 310 | 490 | 72 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-117+00-IC-SW | 10/5/2006 | 0.0-0.1 | in-channel | 2.5Y 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, very fine and fine roots, very few coarse sand | 1 | SM | 26.7 | 4 | 11 | 8 | 10 | 25 | 58 | 12 | Dow |
| RG-117+00-IC-SW | 10/5/2006 | 0.0-0.1 Lab Duplicate | in-channel | 2.5Y 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, very fine and fine roots, very few coarse sand | 1 | SM | 27.5 | 6 | 10 | 10 | 9 | 140 | 170 | 26 | Dow |
| RG-117+00-IC-SW | 10/5/2006 | 0.1-0.7 | in-channel | 10YR 2/1 black very fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive | 2 | SM | 28.9 | 11 | 87 | 42 | 44 | 110 | 290 | 49 | Dow |
| RG-117+00-IC-SW | 10/5/2006 | 0.7-1.5 | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand | 3 | SM | 15.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-117+00-SW30 | 12/13/2006 | 0.0-0.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, many very fine roots, few coarse sand | A | ML/CL | 20.9 | 36 | 150 | 93 | 68 | 140 | 490 | 97 | Alta |
| RG-117+00-SW30 | 12/13/2006 | 0.5-2.0 | low terrace | 10YR 4/2 dark grayish brown silty clay loam, <15% gravel, moist, subangular blocky, moist, friable, moderately plastic, common very fine roots, medium angular gravel, sand fraction fluctuates across horizon | C1 | CL | 12.2 | 44 | 70 | 39 | 33 | 110 | 300 | 81 | Alta |
| RG-117+00-SW30 | 12/13/2006 | 2.0-3.0 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few very fine roots, horizon divided for sample analysis | C2 | ML/CL | 20 | 170 | 160 | 93 | 95 | 470 | 980 | 290 | Alta |
| RG-117+00-SW30 | 12/13/2006 | 3.0-4.0 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few very fine roots, horizon divided for sample analysis | C2 | ML/CL | 26.3 | 6 | 8 | <4 | 4 | 13 | 31* | 10* | Alta |
| RG-117+00-SW30 | 12/13/2006 | 4.0-4.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few very fine roots, horizon divided for sample analysis | C2 | ML/CL | 23.1 | <4 | 4 | <4 | <4 | 6 | <20* | <10* | Alta |
| RG-117+00-SW30 | 12/13/2006 | 4.5-6.2 | low terrace | 10YR 5/2 grayish brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, some dark staining from organic matter, dense toward bottom of horizon | C3 | CL | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-117+00-SW90 | 12/7/2006 | 1.1-2.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 10.3 | 17 | 170 | 85 | 67 | 100 | 440 | 74 | Alta |
| RG-117+00-SW90 | 12/7/2006 | 2.0-3.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 11.8 | 15 | 130 | 54 | 48 | 86 | 340 | 59 | Alta |
| RG-117+00-SW90 | 12/7/2006 | 3.0-4.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 12.8 | 11 | 41 | 20 | 20 | 35 | 130 | 27 | Alta |
| RG-117+00-SW90 | 12/7/2006 | 4.0-5.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 10.7 | 11 | 200 | 57 | 67 | 68 | 400 | 65 | Alta |
| RG-117+00-SW90 | 12/7/2006 | 5.0-6.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 12.6 | 6 | 21 | 9 | 10 | 19 | 65 | 15 | Alta |
| RG-117+00-SW90 | 12/7/2006 | 6.0-7.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/3 brown sandy clay loam, few 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C | CL | 11.8 | 8 | 29 | 13 | 14 | 26 | 89 | 20 | Alta |
| RG-122+00-NE10 | 9/26/2006 | 0.0-0.2 | natural levee | 10YR 5/2 grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | C1 | SP | 7.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-122+00-NE10 | 9/26/2006 | 0.2-0.9 | natural levee | 10YR 5/2 grayish brown , > or =90% gravel, dry, single grain, dry, loose, Non-plastic, fine gravel, noncohesive, angular grains, sand and silt included, fill material | C2 | GM | 3.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-122+00-NE45 | 9/26/2006 | 0.0-1.3 | low terrace | 10YR 5/2 grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, 2 layers of very fine sandy loam less than 0.1" thickness | C1 | SP | 5.3 | <4 | 6 | <4 | <4 | 10 | <20 * | <10 * | Alta |
| RG-122+00-NE45 | 9/26/2006 | 1.3-1.9 | low terrace | 10YR 2/1 black loamy very fine sand, <15% gravel, dry, granular, dry, slightly hard, slightly plastic, very few very fine roots, cohesive, very few angular gravel | C2 | SM | 12.7 | <4 | 12 | 6 | 4 | 21 | 43* | <10 * | Alta |
| RG-122+00-NE70 | 9/26/2006 | 0.0-0.8 | floodplain | 10YR 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, very few fine roots, cohesive, layers of very fine sand <0.1' thick | C1 | SM | 11.9 | <4 | 100 | 50 | 50 | 140 | 340 | 48 | Alta |
| RG-122+00-NE70 | 9/26/2006 | 0.8-2.2 | floodplain | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, very few medium and coarse sand | C2 | SP | 3.8 | <4 | 11 | 5 | 5 | 28 | 49* | <10 * | Alta |
| RG-122+00-NE70 | 9/26/2006 | 2.2-3.3 | floodplain | 10YR 4/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, layers of very fine sand <0.1' thick within horizon | C3 | SW | 10.6 | 17 | 130 | 59 | 52 | 240 | 490 | 77 | Alta |

NOTES:

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1/31/2007

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| | | | | | | | | | | | | | | | |
| RG-122+00-SW25 | 12/7/2006 | 0.0-0.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML/CL | 23 | 9 | 42 | 17 | 19 | 48 | 130 | 27 | Alta |
| RG-122+00-SW25 | 12/7/2006 | 0.5-1.6 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown sandy clay loam, <15% gravel, moist, structureless, moist, firm, moderately plastic, few very fine roots, medium angular gravel, horizon divided for sample analysis | C1 | CL | 11.7 | 9 | 46 | 21 | 18 | 37 | 130 | 26 | Alta |
| RG-122+00-SW25 | 12/7/2006 | 1.6-2.7 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown sandy clay loam, <15% gravel, moist, structureless, moist, firm, moderately plastic, few very fine roots, medium angular gravel, horizon divided for sample analysis | C1 | CL | 10.1 | 21 | 27 | 12 | 14 | 42 | 120 | 35 | Alta |
| RG-122+00-SW25 | 12/7/2006 | 2.7-4.0 | low terrace | 10YR 4/3 brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C2 | CL | 13.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-122+00-SW25 | 12/7/2006 | 4.0-5.5 | low terrace | 10YR 4/3 brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis | C2 | CL | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-126+00-NE10 | 11/3/2006 | 0.0-0.5 | natural levee | 10YR 5/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, few very fine roots, Subrounded grains, well sorted. | C | SP | 2.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 0.0-0.5 Field Duplicate | natural levee | 10YR 5/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, few very fine roots, Subrounded grains, well sorted. | C | SP | 2.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 0.5-1.0 | natural levee | 10YR 5/2 grayish brown and 10YR 2/1 black loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, Subrounded grains, somewhat well sorted. | 3AC | SP | 11.8 | <4 | 16 | 14 | 11 | 26 | 67 | 11 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 1.0-1.7 | natural levee | 10YR 5/2 grayish brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, Subrounded grains, well sorted. | 2C | SP | 12.6 | <4 | 20 | 11 | 14 | 27 | 72 | 12 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 1.7-2.6 | natural levee | 10YR 3/1 very dark gray very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few very fine roots | 3Ab | SM | 17.3 | <4 | 13 | 6 | 6 | 20 | 45 | <10 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 2.6-3.6 | natural levee | 10YR 3/3 dark brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, Subrounded grains, very fine sand layer at 3.4'. | 3Bw | SM | 11.3 | <4 | 620 | 330 | 330 | 290 | 1600 | 220 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 3.6-4.1 | natural levee | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, Subrounded grains. | 3C | SP | 53 | <4 | 13 | 6 | 6 | 20 | 45 | <10 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 4.1-5.1 | natural levee | 10YR 4/2 dark grayish brown very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few very fine roots, Wood layer at 4.9'. | 4Ab | SM | 14.7 | 59 | 160 | 100 | 220 | 470 | 1000 | 210 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 5.1-6.3 | natural levee | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, Very few angular glossy black coarse sand, subrounded grains, well sorted. | 4C | SP | 2.6 | 9 | 61 | 31 | 33 | 180 | 310 | 48 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 6.3-7.3 | natural levee | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, Very few angular glossy black coarse sand, subrounded grains, well sorted. | 4C | SP | 2.5 | 4 | 240 | 49 | 76 | 200 | 570 | 80 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 7.3-7.9 | natural levee | 10YR 6/2 light brownish gray fine sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, Few coarse sand, few angular glossy black coarse sand, very few shell fragments, subrounded grains, somewhat well sorted. | 5C | SP | 3.1 | 14 | 120 | 54 | 96 | 290 | 570 | 93 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 7.9-9.2 | natural levee | 10YR 7/2 light gray very fine sand, few 5YR 4/6 yellowish red mottle, dry, single grain, dry, loose, Non-plastic, Burnt wood layer at 8.2', subrounded grains, well sorted. | 6C | SP | 4 | 5 | 85 | 30 | 86 | 200 | 410 | 67 | Dow |
| RG-126+00-NE10 | 11/3/2006 | 9.2-9.9 | natural levee | 10YR 6/3 pale brown sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, few medium roots, Burnt wood from 9.7-9.9', refusal on gravel at 9.9'. | 6C2 | SW | 6.9 | 17 | 730 | 370 | 400 | 810 | 2300 | 330 | Dow |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-126+00-NE30 | 11/3/2006 | 0.0-0.7 | low terrace | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, very few fine roots, Subrounded grains, well sorted. | C | SP | 4 | <4 | 6 | <4 | <4 | 9 | <20 * | <10 * | Dow |
| RG-126+00-NE30 | 11/3/2006 | 0.0-0.7 Field Duplicate | low terrace | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, very few fine roots, Subrounded grains, well sorted. | C | SP | 3 | <4 | 7 | <4 | <4 | 10 | <20 * | <10 * | Dow |
| RG-126+00-NE30 | 11/3/2006 | 0.7-1.5 | low terrace | 10YR 2/1 black very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots | A | SM | 16.5 | <4 | 48 | 28 | 21 | 38 | 140 | 19 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 1.5-2.1 | low terrace | 10YR 4/3 brown loamy very fine sand, <15% gravel, dry, single grain, dry, loose, Non-plastic, Subrounded grains | Bw | SM | 6.1 | 6 | 1500 | 660 | 640 | 480 | 3300 | 460 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 2.1-3.0 | low terrace | 10YR 3/3 dark brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few fine roots, Wood layer at 2.7'. | 2Bw2 | SM | 18 | 7 | 710 | 170 | 180 | 170 | 1200 | 170 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 3.0-4.4 | low terrace | 10YR 7/2 light gray and 10YR 4/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few medium roots, Subrounded grains, somewhat well sorted. | 2C | SP | 6.6 | 22 | 1300 | 800 | 740 | 850 | 3700 | 530 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 4.4-4.8 | low terrace | 10YR 3/2 very dark grayish br and 10YR 5/3 brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, Very few angular black glossy coarse sand, subrounded grains, alternating layers of the 2 colors. | 3C | SP | 10.1 | 5 | 94 | 42 | 62 | 200 | 410 | 60 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 4.8-6.9 | low terrace | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, Wood layer at 6.4', subrounded grains. | 4C | SP | 3.3 | 6 | 130 | 94 | 110 | 510 | 850 | 120 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 6.9-8.7 Lab Duplicate | low terrace | 10YR 5/4 yellowish brown and 10YR 3/1 very dark gray loamy very fine sand, dry, single grain, dry, loose, Non-plastic, Subrounded grains, layers of very fine sandy loam, somewhat well sorted. | 5C | SP | 10.9 | 19 | 180 | 84 | 120 | 540 | 940 | 140 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 6.9-8.7 | low terrace | 10YR 5/4 yellowish brown and 10YR 3/1 very dark gray loamy very fine sand, dry, single grain, dry, loose, Non-plastic, Subrounded grains, layers of very fine sandy loam, somewhat well sorted. | 5C | SP | 21 | 18 | 160 | 74 | 150 | 610 | 1000 | 160 | Dow |
| RG-126+00-NE30 | 11/3/2006 | 8.7-9.9 | low terrace | 10YR 4/4 dark yellowish brown loamy very fine sand, few 5YR 3/4 dark reddish brown mottle, <15% gravel, moist, single grain, moist, loose, Non-plastic, Burnt wood at 9.8'. | 6C | SM | 26 | 23 | 530 | 270 | 300 | 830 | 2000 | 280 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-126+00-NE80 | 11/3/2006 | 0.0-1.1 Lab Duplicate | floodplain | 10YR 2/1 black very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots | A | SM | 15.9 | 5 | 200 | 73 | 100 | 170 | 550 | 82 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 0.0-1.1 | floodplain | 10YR 2/1 black very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots | A | SM | 15.8 | 6 | 290 | 110 | 110 | 140 | 650 | 93 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 1.1-2.4 | floodplain | 10YR 6/3 pale brown and 10YR 3/3 dark brown very fine sand, dry, single grain, dry, loose, Non-plastic, Four layers of very fine sandy loam, subrounded grains, somewhat well sorted. | C | SP | 5 | 19 | 180 | 110 | 130 | 520 | 960 | 140 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 2.4-3.9 | floodplain | 10YR 6/3 pale brown and 10YR 3/3 dark brown very fine sand, dry, single grain, dry, loose, Non-plastic, Four layers of very fine sandy loam, subrounded grains, somewhat well sorted. | C | SP | 7.7 | 43 | 450 | 270 | 290 | 640 | 1700 | 270 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 3.9-4.7 | floodplain | 10YR 6/3 pale brown loamy very fine sand, moist, single grain, dry, loose, Non-plastic, Subrounded grains. | 2C | SM | 8.8 | 55 | 130 | 58 | 98 | 610 | 950 | 180 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 4.7-5.5 | floodplain | 10YR 5/3 brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, Subrounded grains, few coarse sand. | 2C2 | SM | 18.2 | 100 | 610 | 210 | 300 | 980 | 2200 | 390 | Dow |
| RG-126+00-NE80 | 11/3/2006 | 5.5-5.7 | floodplain | N 2/0 black loamy very fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, petrochemical odor, Black and greasy | 3C | SM | 46.4 | 42 | 1100 | 360 | 480 | 1600 | 3500 | 510 | Dow |
| RG-130+50-IC-C | 10/5/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few shell fragments, very few medium and coarse sand, medium sand layer at 0.4', well sorted | 1 | SP | 2.5 | <4 | 4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RG-130+50-IC-C | 10/5/2006 | 0.4-1.6 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, very few fine gravel, well sorted | 2 | SP | 4.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-130+50-IC-C | 10/5/2006 | 1.6-2.0 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few shell fragments, very few fine gravel, well sorted | 3 | SP | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-130+50-IC-C | 10/5/2006 | 2.0-2.3 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, very few shell fragments, very few fine gravel, somewhat well sorted | 4 | SP | 12.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-130+50-IC-C | 10/5/2006 | 2.3-2.5 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, common fine roots, noncohesive, subrounded grains, fine, medium and coarse roots, few coarse sand | 5 | SM | 38 | <4 | <4 | <4 | <4 | <9 | <25 | <10 | Dow |
| RG-130+50-IC-C | 10/5/2006 | 2.3-2.5 Lab Duplicate | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, common fine roots, noncohesive, subrounded grains, fine, medium and coarse roots, few coarse sand | 5 | SM | 39.5 | <4 | <4 | <4 | <7 | <13 | <32 | <10 | Dow |

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|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-130+50-IC-NE | 10/5/2006 | 0.0-0.5 | in-channel | 10YR 4/3 brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, very few angular glossy black medium and coarse sand, well sorted | 1 | SP | 15.9 | <4 | 4 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RG-130+50-IC-NE | 10/5/2006 | 0.5-0.9 | in-channel | 10YR 4/1 dark gray loamy fine sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, fine and medium gravel, somewhat well sorted | 2 | SP | 16.4 | <4 | 5 | <4 | 4 | 7 | <20 * | <10 * | Dow |
| RG-130+50-IC-NE | 10/5/2006 | 0.9-1.2 | in-channel | 10YR 3/1 very dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, fine gravel, few angular glossy black coarse sand, poorly sorted | 3 | SW | 11.4 | <4 | 160 | 54 | 57 | 34 | 300 | 44 | Dow |
| RG-130+50-IC-SW | 10/5/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few angular glossy black medium and coarse sand, somewhat well sorted | 1 | SP | 8 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RG-130+50-IC-SW | 10/5/2006 | 0.3-0.9 | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, very few angular glossy black medium and coarse sand, fine gravel, somewhat well sorted | 2 | SP | 15.8 | <4 | 6 | <4 | 4 | 4 | <20 * | <10 * | Dow |
| RG-130+50-IC-SW | 10/5/2006 | 0.9-1.3 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and subangular grains, few shell fragments, few angular glossy black medium and coarse sand, somewhat well sorted | 3 | SP | 15.2 | <4 | 8 | 4 | 5 | 14 | 30* | <10 * | Dow |

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|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-130+50-NE10 | 9/26/2006 | 0.0-0.4 | natural levee | 10YR 5/2 grayish brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, very well sorted | C1 | SP | 4.6 | <4 | 7 | <4 | <4 | 12 | <20 * | <10 * | Alta |
| RG-130+50-NE10 | 9/26/2006 | 0.4-1.0 | natural levee | 10YR 4/2 dark grayish brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, very few medium and coarse sand, somewhat well sorted | AC | SP | 9.7 | <4 | 62 | 21 | 24 | 78 | 190 | 26 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 1.0-1.7 | natural levee | 10YR 2/1 black sandy clay loam, dry, granular, dry, slightly hard, slightly plastic, few very fine roots, cohesive, very few coarse sand, very fine and fine roots | Ab | SM | 8.8 | <4 | 36 | 11 | 12 | 24 | 83 | 13 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 1.7-2.8 | natural levee | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, somewhat well sorted Appendix 9 Sample | 2AC2 | SP | 5.8 | 5 | 660 | 310 | 240 | 290 | 1500 | 200 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 2.8-3.6 | natural levee | 10YR 5/2 grayish brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, very few medium and coarse sand, well sorted | 2C | SP | 1.3 | <4 | 120 | 52 | 31 | 63 | 270 | 35 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 3.6-4.0 | natural levee | 10YR 4/2 dark grayish brown loamy very fine sand, few mottle, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, 5% light mottles, somewhat well sorted | 2C2 | SP | 6.7 | 6 | 150 | 92 | 70 | 260 | 570 | 77 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 4.0-4.9 | natural levee | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 2C3 | SP | 2.5 | 7 | 92 | 45 | 34 | 120 | 300 | 44 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 4.9-6.0 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded and rounded grains, well sorted | 2C4 | SP | 1.7 | 5 | 59 | 37 | 83 | 400 | 590 | 84 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 6.0-7.7 | natural levee | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted Appendix 9 Sample | 2C5 | SP | 2 | 24 | 61 | 22 | 46 | 210 | 360 | 72 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 7.7-8.8 | natural levee | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted Appendix 9 Sample | 2C5 | SP | 3.7 | 21 | 110 | 49 | 73 | 250 | 500 | 88 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 8.8-9.4 | natural levee | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted Appendix 9 Sample | 2C5 | SP | 2.8 | 14 | 21 | 91 | 130 | 600 | 860 | 130 | Alta |
| RG-130+50-NE10 | 9/26/2006 | 9.4-9.8 | natural levee | 10YR 6/2 light brownish gray sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, well sorted 9.8' - Coarse sand and fine gravel <0.1' thick | 2C6 | SP | 2.3 | <4 | 37 | 10 | 110 | 170 | 330 | 62 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-130+50-NE30 | 9/26/2006 | 0.0-0.6 | low terrace | 10YR 5/2 grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, very few medium sand, well sorted | C1 | SP | 6.6 | <4 | 7 | 4 | <4 | 14 | 26* | <10* | Alta |
| RG-130+50-NE30 | 9/26/2006 | 0.6-1.6 | low terrace | 10YR 2/1 black sandy clay loam, dry, granular, dry, slightly hard, slightly plastic, very few very fine roots, cohesive | A | SM | 13 | <4 | 8 | <4 | <4 | <11 | <31* | <10* | Alta |
| RG-130+50-NE30 | 9/26/2006 | 1.6-2.8 | low terrace | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, somewhat well sorted Appendix 9 Sample | 2AC7 | SP | 4.6 | <4 | 140 | 65 | 53 | 98 | 360 | 48 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 2.8-4.1 | low terrace | 10YR 5/2 grayish brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, very few medium and coarse sand, well sorted Appendix 9 Sample | 2C2 | SP | 1.3 | <4 | 30 | 13 | 13 | 55 | 110 | 16 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 4.1-4.4 | low terrace | 10YR 4/2 dark grayish brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, somewhat well sorted | 2C3 | SP | 4.4 | 6 | 180 | 100 | 79 | 210 | 580 | 79 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 4.4-5.4 | low terrace | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 2C4 | SP | 1.7 | 4 | 14 | 7 | 8 | 63 | 96 | 16 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 5.4-6.4 | low terrace | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 2C4 | SP | 3.3 | 19 | 92 | 33 | 39 | 210 | 400 | 68 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 6.4-7.2 | low terrace | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 2C4 | SP | 2.9 | <4 | 53 | 18 | 24 | 130 | 230 | 32 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 7.2-7.9 | low terrace | 10YR 5/3 brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains, very few coarse sand | 2C5 | SP | 4.2 | 62 | 110 | 63 | 120 | 380 | 730 | 160 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 7.9-8.8 | low terrace | 10YR 4/3 brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, few medium roots, noncohesive, subrounded grains | 2C6 | SP | 19.6 | 1600 | 960 | 490 | 1800 | 4900 | 9700 | 3000 | Alta |
| RG-130+50-NE30 | 9/26/2006 | 8.8-9.4 | low terrace | 10YR 5/3 brown very fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, very few fine gravel, somewhat poorly sorted | 2C7 | SW | 5.8 | 83 | 340 | 120 | 160 | 490 | 1200 | 240 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-130+50-NE80 | 9/26/2006 | 0.0-0.7 | floodplain | 10YR 3/1 very dark gray very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots, cohesive | A | SM | 16.9 | 4 | 29 | 14 | 16 | 70 | 130 | 21 | Alta |
| RG-130+50-NE80 | 9/26/2006 | 0.7-2.1 | floodplain | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand | Bw | SP | 7.5 | 83 | 370 | 250 | 580 | 2100 | 3400 | 570 | Alta |
| RG-130+50-NE80 | 9/26/2006 | 2.1-3.5 | floodplain | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, noncohesive, subrounded grains, well sorted | C1 | SP | 1.1 | 6 | 130 | 52 | 45 | 150 | 380 | 54 | Alta |
| RG-130+50-NE80 | 9/26/2006 | 3.5-4.1 | floodplain | 10YR 4/3 brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few medium roots, noncohesive, subrounded grains | 2C2 | SM | 17.8 | 16 | 500 | 220 | 180 | 1000 | 1900 | 250 | Alta |
| RG-130+50-NE80 | 9/26/2006 | 4.1-4.4 | floodplain | 10YR 2/1 black and 10YR 4/1 dark gray loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains | 3C3 | SM | 25.7 | 33 | 1700 | 380 | 430 | 820 | 3400 | 470 | Alta |
| RG-130+50-SW40 | 12/7/2006 | 1.1-2.2 | intermediate terrace | 10YR 4/2 dark grayish brown sandy loam, common 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, structureless, moist, very friable, slightly plastic, grades to sand horizon divided for sample analysis crushed rock 1.1-1.6' | C1 | SM | 11.4 | <4 | 14 | 5 | 5 | 7 | 31* | <10* | Alta |
| RG-130+50-SW40 | 12/7/2006 | 2.2-3.3 | intermediate terrace | 10YR 4/2 dark grayish brown sandy loam, common 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, structureless, moist, very friable, slightly plastic, grades to sand horizon divided for sample analysis crushed rock 1.1-1.6' | C1 | SM | 9.2 | <4 | 25 | 10 | 9 | 14 | 58 | 10 | Alta |
| RG-130+50-SW40 | 12/7/2006 | 3.3-4.3 | intermediate terrace | 10YR 6/2 light brownish gray fine sand, common 10YR 5/4 yellowish brown and 10YR 3/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few coarse sand, shell fragments | C2 | SP | 12.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-130+50-SW40 | 12/7/2006 | 4.3-5.3 | intermediate terrace | 10YR 5/1 gray sandy clay loam, common 10YR 4/4 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic | C3 | CL | 18.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-130+50-SW40 | 12/7/2006 | 5.3-6.1 | intermediate terrace | 10YR 3/2 very dark grayish br and 10YR 4/4 dark yellowish brown fine sandy loam, <15% gravel, moist, structureless, moist, friable, slightly plastic, few shell fragments | C4 | SM | 17 | <4 | 8 | 4 | <4 | 6 | <20* | <10* | Alta |
| RG-130+55-NE30 | 11/13/2006 | 9.4-9.8 | low terrace | 10YR 4/3 brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic, subrounded grains | 4C | SM | 24.8 | 110 | 590 | 370 | 370 | 2200 | 3600 | 560 | Alta |
| RG-130+55-NE30 | 11/13/2006 | 9.8-10.8 | low terrace | 10YR 5/4 yellowish brown sand, 15-35% gravel, dry, single grain, dry, loose, Non-plastic, fine gravel, subrounded and subangular grains | 5C | SM | 8.3 | 4 | 710 | 290 | 220 | 220 | 1400 | 190 | Alta |
| RG-130+55-NE30 | 11/13/2006 | 10.8-11.8 | low terrace | 10YR 5/4 yellowish brown sand, 15-35% gravel, dry, single grain, dry, loose, Non-plastic, fine gravel, subrounded and subangular grains | 5C | SM | 9.2 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Alta |
| RG-130+55-NE30 | 11/13/2006 | 11.8-12.0 | low terrace | 10YR 3/1 very dark gray very fine sandy loam, moist, granular, moist, friable, slightly plastic, few coarse sand | 6C | SM | 15.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-130+55-NE80 | 11/14/2006 | 4.4-4.7 | floodplain | 10YR 5/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, well sorted, subrounded grains | 4C | SP | 3.5 | 6 | 120 | 54 | 45 | 270 | 490 | 66 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 4.7-5.4 | floodplain | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown very fine sandy loam, moist, granular, moist, friable, slightly plastic | 5C | SM | 26.7 | 100 | 11000 | 2300 | 3200 | 2200 | 19000 | 2700 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 5.4-6.2 | floodplain | 10YR 5/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, very thin wood layer at 5.9' and 7.0' subrounded grains | 6C | SM | 7.2 | 48 | 230 | 120 | 110 | 440 | 940 | 170 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 5.4-6.2 Field Duplicate | floodplain | 10YR 5/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, very thin wood layer at 5.9' and 7.0' subrounded grains | 6C | SM | 9.4 | 390 | 11000 | 1800 | 2900 | 1900 | 18000 | 2900 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 6.2-7.8 Field Duplicate | floodplain | 10YR 5/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, very thin wood layer at 5.9' and 7.0' subrounded grains | 6C | SM | 16.7 | 45 | 2900 | 1300 | 1000 | 2200 | 7500 | 1000 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 6.2-7.8 | floodplain | 10YR 5/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, very thin wood layer at 5.9' and 7.0' subrounded grains | 6C | SM | 10.6 | 56 | 870 | 230 | 250 | 730 | 2100 | 330 | Alta |
| RG-130+55-NE80 | 11/14/2006 | 7.8-8.0 | floodplain | 7.5YR 4/4 brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, fine to medium gravel, subrounded and subangular grains | 7C | SM | 5.3 | <4 | 27 | 15 | 14 | 24 | 80 | 13 | Alta |
| RG-135+50-IC-C | 10/5/2006 | 0.0-0.8 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, fine gravel, very few angular glossy black coarse sand, well sorted | 1 | SP | 3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-135+50-IC-C | 10/5/2006 | 0.8-1.4 | in-channel | 10YR 2/1 black , Wood/black material | 2 | -- | 49.1 | <4 | 110 | 23 | 44 | 70 | 250 | 38 | Dow |
| RG-135+50-IC-C | 10/5/2006 | 1.4-1.7 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few shell fragments, common coarse sand, fine gravel, very few angular glossy black coarse sand | 3 | SM | 15.8 | <4 | 5 | <4 | <4 | 7 | <20 * | <10 * | Dow |
| RG-135+50-IC-C | 10/5/2006 | 1.7-2.0 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, sand and gravel, noncohesive, subrounded and subangular grains, common shell fragments, fine and medium gravel | 4 | SM | 12.2 | <4 | 11 | 4 | 4 | 8 | 27* | <10 * | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-135+50-IC-NE | 10/5/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, very few shell fragments, very few angular glossy black coarse sand, well sorted Field Duplicate | 1 | SP | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-135+50-IC-NE | 10/5/2006 | 0.0-0.5 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, very few shell fragments, very few angular glossy black coarse sand, well sorted Field Duplicate | 1 | SP | 8.2 | <4 | 8 | 5 | 4 | 5 | 22* | <10 * | Dow |
| RG-135+50-IC-NE | 10/5/2006 | 0.5-1.4 | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, subrounded grains, very few fine gravel, very few angular glossy black coarse sand, fine and medium roots/black material layer at 1.4' Field Duplicate | 2 | SM | 15.7 | <4 | 9 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RG-135+50-IC-NE | 10/5/2006 | 0.5-1.4 Field Duplicate | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, subrounded grains, very few fine gravel, very few angular glossy black coarse sand, fine and medium roots/black material layer at 1.4' Field Duplicate | 2 | SM | 16.5 | <4 | 10 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RG-135+50-IC-SW | 10/6/2006 | 0.0-0.8 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, fine and medium sand, noncohesive, subrounded grains, fine and medium roots/black material, very few angular glossy black coarse sand,very few shell fragments, somewhat well sorted | 1 | SP | 15.1 | <4 | 14 | 5 | 5 | 7 | 30* | <10 * | Dow |
| RG-135+50-IC-SW | 10/6/2006 | 0.8-1.4 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few fine roots, noncohesive, subrounded grains, fine roots/black material, fine gravel, layer of black material at 1.4', very few angular glossy black coarse sand,very few shell fragments | 2 | SM | 8.7 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RG-135+50-IC-SW | 10/6/2006 | 1.4-1.6 | in-channel | 10YR 3/1 very dark gray coarse sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and subangular grains, few angular glossy black coarse sand, common shell fragments, somewhat well sorted | 3 | SP | 14.6 | <4 | 5 | <4 | 4 | 6 | <20 * | <10 * | Dow |
| RG-135+50-NE10 | 9/26/2006 | 0.0-0.8 | low terrace | 10YR 3/2 very dark grayish br very fine sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots, cohesive | A | SM | 26.5 | <4 | 45 | 18 | 17 | 55 | 140 | 21 | Alta |
| RG-135+50-NE10 | 9/26/2006 | 0.8-2.1 | low terrace | 10YR 4/2 dark grayish brown loamy very fine sand, many 5YR 3/4 dark reddish brown mottle, moist, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, somewhat well sorted | Bw | SP | 18.4 | 12 | 2200 | 520 | 560 | 510 | 3800 | 510 | Alta |
| RG-135+50-NE10 | 9/26/2006 | 2.1-2.6 | low terrace | 10YR 5/4 yellowish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, somewhat well sorted | C1 | SP | 16.2 | 35 | 610 | 600 | 510 | 1900 | 3600 | 500 | Alta |
| RG-135+50-NE10 | 9/26/2006 | 2.6-4.4 | low terrace | 10YR 5/3 brown loamy very fine sand, common 7.5YR 3/4 dark brown mottle, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and rounded grains, very few coarse sand, somewhat well sorted | C2 | SP | 17.4 | 460 | 680 | 310 | 520 | 1600 | 3500 | 930 | Alta |

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-135+50-NE30 | 9/26/2006 | 0.0-0.8 | floodplain | 10YR 2/1 black silt loam, moist, granular, moist, friable, very few very fine roots, very fine and fine roots | A | ML | 22.6 | 12 | 39 | 26 | 23 | 59 | 160 | 32 | Alta |
| RG-135+50-NE30 | 9/26/2006 | 0.8-1.4 | floodplain | 10YR 4/3 brown loamy very fine sand, common 5YR 3/3 dark reddish brown mottle, dry, single grain, dry, loose, Non-plastic, very few very fine roots, noncohesive | Bw | SM | 16.7 | 10 | 130 | 57 | 81 | 220 | 500 | 79 | Alta |
| RG-135+50-NE30 | 9/26/2006 | 1.4-3.3 | floodplain | 10YR 4/2 dark grayish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive, subrounded grains | Bw2 | SP | 17.3 | 21 | 290 | 110 | 92 | 340 | 850 | 130 | Alta |
| RG-135+50-NE30 | 9/26/2006 | 3.3-3.7 | floodplain | 10YR 4/2 dark grayish brown very fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, well sorted | C1 | SP | 16 | 290 | 12000 | 6300 | 5400 | 8300 | 32000 | 4500 | Alta |
| RG-135+50-NE30 | 9/26/2006 | 3.7-4.1 | floodplain | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, somewhat well sorted | 2C2 | SP | 23.7 | 520 | 1200 | 480 | 1000 | 2800 | 6000 | 1400 | Alta |
| RG-135+50-NE30 | 9/26/2006 | 4.1-4.4 | floodplain | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, well sorted | 3C3 | SP | 6.8 | 80 | 80 | 33 | 120 | 490 | 800 | 190 | Alta |
| RG-135+50-SW15 | 12/12/2006 | 3.8-5.7 Lab Duplicate | intermediate terrace | 10YR 4/3 brown clay loam, moist, angular blocky, moist, firm, moderately plastic | 2C2 | CL | 16.9 | <4 | 50 | 22 | 21 | 18 | 110 | 18 | Dow |
| RG-135+50-SW15 | 12/12/2006 | 3.8-5.7 | intermediate terrace | 10YR 4/3 brown clay loam, moist, angular blocky, moist, firm, moderately plastic | 2C2 | CL | 16.5 | <4 | 43 | 19 | 19 | 16 | 96 | 17 | Dow |
| RG-135+50-SW15 | 12/12/2006 | 5.7-6.9 | intermediate terrace | 10YR 3/2 very dark grayish br silty clay loam, moist, angular blocky, moist, firm, moderately plastic | 2C3 | CL | 22.1 | <5 LISR | 5 | <4 | <4 | <20 LISR | <37 * | <10 * | Dow |
| RG-135+50-SW15 | 12/12/2006 | 6.9-8.0 | intermediate terrace | 10YR 4/3 brown silty clay loam, moist, structureless, moist, firm, moderately plastic | 2C4 | CL | 21.1 | <6 LISR | <4 | <4 | <18 LISR | <4 | <36 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-135+50-SW95 | 12/7/2006 | 0.0-0.5 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common medium roots | A | ML/CL | 22.5 | 16 | 200 | 84 | 73 | 130 | 500 | 80 | Alta |
| RG-135+50-SW95 | 12/7/2006 | 0.5-1.2 | wetland | 10YR 4/3 brown fine sandy loam, <15% gravel, moist, subangular blocky, weak, moist, very friable, slightly plastic, few medium roots | Bw | SM | 14.8 | 8 | 230 | 100 | 76 | 98 | 510 | 73 | Alta |
| RG-135+50-SW95 | 12/7/2006 | 1.2-2.0 | wetland | 10YR 4/2 dark grayish brown clay loam, moist, angular blocky, moist, firm, moderately plastic | C1 | CL | 20.3 | 7 | 850 | 340 | 280 | 230 | 1700 | 230 | Alta |
| RG-135+50-SW95 | 12/7/2006 | 2.0-3.2 Field Duplicate | wetland | 10YR 3/3 dark brown clay loam, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis | C2 | CL | 23.4 | <4 | 41 | 14 | 13 | 15 | 83 | 13 | Alta |
| RG-135+50-SW95 | 12/7/2006 | 2.0-3.2 | wetland | 10YR 3/3 dark brown clay loam, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis | C2 | CL | 21.4 | <4 | 15 | 6 | 5 | 7 | 34* | <10* | Alta |
| RG-135+50-SW95 | 12/7/2006 | 3.2-4.5 | wetland | 10YR 3/3 dark brown clay loam, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis | C2 | CL | 17.4 | <4 | 7 | <4 | <4 | 5 | <20* | <10* | Alta |
| RG-135+50-SW95 | 12/7/2006 | 4.5-5.6 | wetland | 10YR 4/4 dark yellowish brown clay loam, moist, angular blocky, weak, moist, firm, moderately plastic, few shell fragments horizon divided for analysis | C3 | CL | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-135+50-SW95 | 12/7/2006 | 5.6-6.7 | wetland | 10YR 4/4 dark yellowish brown clay loam, wet, angular blocky, weak, moist, firm, moderately plastic, horizon divided for analysis | C3 | CL | 17.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-135+55-NE10 | 11/8/2006 | 4.4-5.4 | low terrace | 10YR 5/3 brown loamy very fine sand, common 7.5YR 3/4 dark brown mottle, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and rounded grains, very few coarse sand, somewhat well sorted | C2 | SP | 13.1 | 100 | 330 | 180 | 260 | 740 | 1600 | 320 | Dow |
| RG-135+55-NE10 | 11/8/2006 | 5.4-5.7 | low terrace | N 3/0 very dark gray sand, wet, single grain, moist, loose, Non-plastic, petrochemical odor, thin layer of silt loam at 5.4' and 5.7' | Cg1 | SP | 22.1 | 85 | 920 | 390 | 610 | 1300 | 3300 | 550 | Dow |
| RG-135+55-NE10 | 11/8/2006 | 5.7-7.6 | low terrace | 2.5Y 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, petrochemical odor, gravel near bottom, subrounded | Cg2 | SP | 15.1 | 11 | 64 | 25 | 38 | 110 | 250 | 44 | Dow |
| RG-135+55-NE10 | 11/8/2006 | 5.7-7.6 Field Duplicate | low terrace | 2.5Y 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, petrochemical odor, gravel near bottom, subrounded | Cg2 | SP | 15.3 | 11 | 61 | 28 | 40 | 120 | 260 | 46 | Dow |
| RG-135+55-NE10 | 11/8/2006 | 7.6-8.2 | low terrace | 10YR 2/1 black, <15% gravel, wet, structureless, Non-plastic, petrochemical odor, Horizon almost entirely decomposing wood fragments, rounded gravel at 8.2' small amount of 2.5Y 4/1 sand, around wood | -- | -- | 46.4 | <4 | 15 | 6 | 6 | 17 | 43* | <10* | Alta |
| RG-135+55-NE10 | 11/8/2006 | 8.2-9.5 | low terrace | 2.5Y 4/1 dark gray sandy clay, <15% gravel, moist, massive, moist, extremely firm, very plastic, petrochemical odor, weak hydrocarbon odor, fine rounded gravel dispersed throughout the horizon (sandy clay matrix) | Cg3 | CH | 8.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-135+55-NE30 | 11/13/2006 | 4.4-5.7 | floodplain | 2.5Y 5/2 grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, very thin layer deposition pattern, somewhat well sorted, subrounded grains | 4C | SP | 5 | 8 | 72 | 26 | 43 | 340 | 490 | 69 | Alta |
| RG-135+55-NE30 | 11/13/2006 | 5.7-6.7 | floodplain | 10YR 4/1 dark gray loamy fine sand, dry, single grain, dry, loose, Non-plastic, subrounded grains, somewhat poorly sorted | 5C | SM | 15.2 | 7 | 78 | 26 | 32 | 160 | 300 | 45 | Alta |
| RG-135+55-NE30 | 11/13/2006 | 6.7-8.0 Lab Duplicate | floodplain | 2.5Y 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, angular glossy black coarse sand, few fine gravel, subrounded grains | 6C | SM | 10.3 | <4 | 8 | <4 | 16 | 27 | 51 | 11 | Alta |
| RG-135+55-NE30 | 11/13/2006 | 6.7-8.0 | floodplain | 2.5Y 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, angular glossy black coarse sand, few fine gravel, subrounded grains | 6C | SM | 10.3 | <4 | 12 | <4 | 25 | 40 | 76 | 16 | Alta |
| RG-140+00-IC-C | 10/6/2006 | 0.0-1.6 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, fine and medium sand, noncohesive, subrounded grains, very few fine and medium roots/black material, very few shell fragments, very few angular glossy black coarse sand, well sorted | 1 | SP | 4.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RG-140+00-IC-C | 10/6/2006 | 1.6-2.5 | in-channel | 10YR 4/2 dark grayish brown loamy sand, wet, single grain, moist, loose, Non-plastic, fine and medium loamy sand, noncohesive, subrounded grains, few coarse sand, very few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 2 | SP | 15.2 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RG-140+00-IC-C | 10/6/2006 | 2.5-2.7 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, few fine and medium gravel, very few shell fragments, somewhat well sorted | 3 | SP | 12.7 | <4 | 11 | <4 | <4 | <4 | <20 * | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|---------------------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-140+00-IC-NE | 10/6/2006 | 0.0-1.0 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few angular glossy black medium sand, well sorted Field Duplicate | 1 | SP | 6.8 | <4 | 11 | 4 | 10 | 29 | 53 | 10 | Dow |
| RG-140+00-IC-NE | 10/6/2006 | 0.0-1.0 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few angular glossy black medium sand, well sorted Field Duplicate | 1 | SP | 6.4 | <4 | 17 | 7 | 14 | 36 | 74 | 13 | Dow |
| RG-140+00-IC-NE | 10/6/2006 | 0.0-1.0 Field Duplicate Lab Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few angular glossy black medium sand, well sorted Field Duplicate | 1 | SP | 6.3 | <4 | 10 | 6 | 8 | 27 | 52 | <10 * | Dow |
| RG-140+00-IC-NE | 10/6/2006 | 1.0-1.9 Field Duplicate | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, few angular glossy black medium and coarse sand, very few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 18.1 | 7 | 54 | 34 | 59 | 170 | 330 | 53 | Dow |
| RG-140+00-IC-NE | 10/6/2006 | 1.0-1.9 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, few angular glossy black medium and coarse sand, very few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 16.9 | 9 | 61 | 26 | 68 | 250 | 410 | 67 | Dow |
| RG-140+00-IC-SW | 10/6/2006 | 0.0-0.3 | in-channel | 10YR 3/3 dark brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, many coarse roots, noncohesive, subrounded grains, very few coarse sand, roots/black material, very few shell fragments | 1 | SM | 28.5 | <5 LISR | 30 | 31 | 21 | 62 | 140 | 18 | Dow |
| RG-140+00-IC-SW | 10/6/2006 | 0.3-0.6 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, very few angular glossy black coarse sand, somewhat well sorted | 2 | SP | 8.8 | <4 | 9 | <4 | <4 | 10 | <20 * | <10 * | Dow |
| RG-140+00-IC-SW | 10/6/2006 | 0.6-0.8 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and subangular grains, very few angular glossy black coarse sand, few shell fragments | 3 | SM | 11.5 | <4 | 32 | 10 | 11 | 10 | 62 | 11 | Dow |
| RG-140+00-IC-SW | 10/6/2006 | 0.8-1.5 | in-channel | 10YR 4/1 dark gray coarse sand, 60-90% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and subangular grains, many fine gravel, few shell fragments, somewhat poorly sorted | 4 | SW | 11.6 | <4 | 32 | 14 | 14 | 26 | 86 | 14 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach G

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-140+00-SW15 | 12/7/2006 | 0.0-1.5 | floodplain | 2.5Y 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, common fine roots, few shell fragments, some decomposing organic matter | A | SP | 22.5 | <4 | 19 | 7 | 6 | 10 | 42* | <10* | Alta |
| RG-140+00-SW15 | 12/7/2006 | 1.5-2.6 | floodplain | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, few thin layers loamy sand, few thin layers darker organic matter horizon divided for sample analysis | C | SP | 19.5 | <4 | 40 | 35 | 27 | 47 | 150 | 22 | Alta |
| RG-140+00-SW15 | 12/7/2006 | 2.6-3.7 | floodplain | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, few thin layers loamy sand, few thin layers darker organic matter horizon divided for sample analysis | C | SP | 20.5 | <4 | 830 | 730 | 410 | 600 | 2600 | 320 | Alta |
| RG-140+00-SW15 | 12/7/2006 | 3.7-4.8 | floodplain | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, few thin layers loamy sand, few thin layers darker organic matter horizon divided for sample analysis | C | SP | 16.1 | <4 | 1800 | 1200 | 770 | 810 | 4500 | 580 | Alta |
| RG-140+00-SW15 | 12/7/2006 | 4.8-6.0 | floodplain | 10YR 2/1 black, wet, contents almost entirely wood, some shell fragments, sand (10YR 5/4) mixed in with wood | -- | -- | 46.2 | 21 | 320 | 120 | 250 | 760 | 1500 | 230 | Alta |
| RG-140+00-SW15 | 12/7/2006 | 6.0-7.0 | floodplain | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, wood from 6.3-6.5, few shell fragments, few coarse sand horizon divided for analysis | Cg | SP | 24.6 | 16 | 310 | 180 | 200 | 660 | 1400 | 200 | Alta |
| RG-140+00-SW15 | 12/7/2006 | 7.0-8.0 | floodplain | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, wood from 7.0-7.3' and 7.5-7.7' horizon divided for analysis | Cg | SP | 24.1 | <4 | 31 | 9 | 10 | 30 | 79 | 13 | Alta |
| RG-140+00-SW200 | 12/13/2006 | 1.6-3.2 | low terrace | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown clay loam, moist, subangular blocky, weak, moist, firm, moderately plastic, few shell fragments, horizon divided for sample analysis | 2C2 | CL | 17.3 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RG-140+00-SW200 | 12/13/2006 | 3.2-4.8 | low terrace | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown clay loam, moist, subangular blocky, weak, moist, firm, moderately plastic, few shell fragments, horizon divided for sample analysis | 2C2 | CL | 20.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-140+00-SW200 | 12/13/2006 | 4.8-6.4 | low terrace | 10YR 5/3 brown silt loam, common 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, horizon divided for sample analysis, freshwater shells | 2C3 | ML | 17.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RG-140+00-SW500 | 12/15/2006 | 0.3-2.1 Field Duplicate | intermediate terrace | 10YR 5/6 yellowish brown sandy clay loam, wet, subangular blocky, moist, friable, slightly plastic, very few fine roots, some sediment from A horizon mixed in from geoprobe, texture varies from sand to sandy clay loam | Bw | SM | 13.3 | 4 | <4 | <4 | <4 | 6 | <20* | <10* | Alta |
| RG-140+00-SW500 | 12/15/2006 | 0.3-2.1 | intermediate terrace | 10YR 5/6 yellowish brown sandy clay loam, wet, subangular blocky, moist, friable, slightly plastic, very few fine roots, some sediment from A horizon mixed in from geoprobe, texture varies from sand to sandy clay loam | Bw | SM | 13.4 | 5 | 4 | <4 | <4 | 9 | <20* | <10* | Alta |
| RG-140+00-SW500 | 12/15/2006 | 2.1-3.0 | intermediate terrace | 10YR 5/4 yellowish brown sandy clay, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, horizon divided for sample analysis, fine gravel imbedded into sandy clay matrix | 2C | CH | 11.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RG-140+00-SW70 | 12/7/2006 | 2.0-2.7 | low terrace | 2.5Y 3/2 very dark grayish br clay loam, moist, angular blocky, moist, firm, moderately plastic, very few very fine roots | C1 | CL | 17.6 | 140 | 960 | 450 | 380 | 490 | 2400 | 450 | Alta |
| RG-140+00-SW70 | 12/7/2006 | 2.7-4.0 | low terrace | 10YR 4/3 brown clay loam, moist, structureless, moist, firm, moderately plastic | C2 | CL | 14.5 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RG-140+00-SW70 | 12/7/2006 | 4.0-4.7 | low terrace | 10YR 4/3 brown loamy fine sand, wet, structureless, moist, very friable, Non-plastic, horizon divided for sample analysis | C3 | SP | 15.9 | <4 | 20 | 12 | 8 | 12 | 52 | <10 * | Alta |
| RG-140+00-SW70 | 12/7/2006 | 4.7-5.7 | low terrace | 10YR 4/3 brown loamy fine sand, wet, structureless, moist, very friable, Non-plastic, horizon divided for sample analysis | C3 | SP | 15.7 | <4 | 17 | 11 | 8 | 5 | 41* | <10 * | Alta |

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Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-143+50-SW130 | 12/12/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML/CL | 26.1 | 24 | 1300 | 680 | 470 | 550 | 3000 | 410 | Alta |
| RH-143+50-SW130 | 12/12/2006 | 0.3-0.9 | low terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown clay loam, moist, angular blocky, weak, moist, friable, moderately plastic, very few medium roots | AC | CL | 20.2 | 87 | 900 | 380 | 420 | 560 | 2300 | 410 | Dow |
| RH-143+50-SW130 | 12/12/2006 | 0.9-1.9 | low terrace | 10YR 4/2 dark grayish brown clay loam, moist, subangular blocky, moist, firm, moderately plastic | C1 | CL | 19.6 | <4 | 300 | 160 | 140 | 150 | 750 | 100 | Dow |
| RH-143+50-SW130 | 12/12/2006 | 1.9-2.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few fine roots, borderline clay loam | 2Ab | CL | 18.9 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RH-143+50-SW130 | 12/12/2006 | 1.9-2.5 Lab Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few fine roots, borderline clay loam | 2Ab | CL | 18.9 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RH-143+50-SW130 | 12/12/2006 | 2.5-4.0 | low terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few shell fragments horizon divided for sample analysis | 2C2 | CL | 19.9 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RH-143+50-SW130 | 12/12/2006 | 4.0-5.1 | low terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few shell fragments horizon divided for sample analysis | 2C2 | CL | 20.8 | <4 | 9 | <4 | 4 | 4 | <20 * | <10 * | Alta |
| RH-143+50-SW130 | 12/12/2006 | 4.0-5.1 Lab Duplicate | low terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few shell fragments horizon divided for sample analysis | 2C2 | CL | 20.8 | <4 | 58 | 22 | 21 | 19 | 120 | 18 | Alta |
| RH-147+00-IC-C | 10/6/2006 | 0.0-0.5 | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, fine and medium sand noncohesive, subrounded grains, few coarse sand, very few fine and medium roots, black material, few shell fragments, very few org glossy black coarse sand, well sorted | 1 | SP | 7.1 | <4 | 7 | <4 | 4 | 5 | <20 * | <10 * | Dow |
| RH-147+00-IC-C | 10/6/2006 | 0.5-1.0 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, very few fine gravel, few angular glossy black coarse sand, somewhat well sorted black material in layer at 1.0' | 2 | SP | 17.1 | <4 | 380 | 550 | 310 | 470 | 1700 | 210 | Dow |
| RH-147+00-IC-C | 10/6/2006 | 1.0-1.2 | in-channel | 10YR 3/1 very dark gray coarse sand, wet, single grain, moist, loose, Non-plastic, common fine roots, medium and coarse sand noncohesive, few fine gravel, shell fragments, common fine and medium roots, black material, somewhat well sorted | 3 | SP | 20 | <4 | 590 | 340 | 270 | 280 | 1500 | 200 | Dow |
| RH-147+00-IC-NE | 10/6/2006 | 0.0-1.8 | in-channel | 10YR 5/2 grayish brown, wet, single grain, moist, loose, Non-plastic, few medium roots, non-cohesive, subrounded grains, very few coarse sand, black material, very few fine gravel, well sorted | 1 | SP | 5.6 | <4 | 14 | 7 | 6 | 18 | 45* | <10 * | Dow |
| RH-147+00-IC-NE | 10/6/2006 | 1.8-2.3 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, very few shell fragments, few fine gravel, few angular glossy black coarse sand. | 2 | SM | 12.1 | <4 | 25 | 9 | 31 | 40 | 110 | 20 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

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1/31/2007

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-147+00-IC-SW | 10/6/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, well sorted | 1 | SP | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RH-147+00-IC-SW | 10/6/2006 | 0.6-1.7 Field Duplicate | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive subrounded grains, very few shell fragments, very few fine gravel | 2 | SM | 14.7 | <4 | 5 | <4 | <4 | 7 | <20 * | <10 * | Dow |
| RH-147+00-IC-SW | 10/6/2006 | 0.6-1.7 | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive subrounded grains, very few shell fragments, very few fine gravel | 2 | SM | 15 | <4 | 6 | <4 | 5 | 11 | 26* | <10 * | Dow |
| RH-158+00-IC-C | 10/7/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, fine and medium sand noncohesive, subrounded grains few coarse sand very few medium roots / black material very few angular glossy black coarse sand somewhat well sorted | 1 | SP | 2.4 | <4 | 10 | 4 | 5 | 8 | 27* | <10 * | Dow |
| RH-158+00-IC-C | 10/7/2006 | 0.4-1.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, few medium roots, fine and medium sand noncohesive, subrounded grains common coarse sand few fine gravel few medium roots / black material few shell fragments somewhat poorly sorted | 2 | SW | 6.8 | <4 | 37 | 8 | 15 | 28 | 89 | 15 | Dow |
| RH-158+00-IC-C | 10/7/2006 | 1.5-1.9 | in-channel | 10YR 4/1 dark gray , wet, single grain, moist, loose, Non-plastic, shells and wood / black material noncohesive | 3 | -- | 30.2 | 13 | 2600 | 640 | 900 | 780 | 4900 | 700 | Dow |
| RH-158+00-IC-C | 10/7/2006 | 1.9-2.2 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, few coarse roots, noncohesive, common coarse sand, few coarse roots / black material very few fine gravel few angular glossy black coarse and medium sand common shell fragments somewhat well sorted | 4 | SP | 17.7 | <4 | 50 | 27 | 29 | 75 | 180 | 27 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-IC-NE | 10/7/2006 | 0.0-0.7 | in-channel | 10YR 5/3 brown coarse sand, wet, single grain, moist, loose, Non-plastic, few medium roots, noncohesive subrounded grains few medium and coarse roots black material few shell fragments very few angular glossy black sand somewhat poorly sorted | 1 | SW | 3.2 | <4 | 23 | 14 | 14 | 42 | 93 | 14 | Dow |
| RH-158+00-IC-NE | 10/7/2006 | 0.7-1.7 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand noncohesive, subrounded grains few angular glossy black coarse sand few shell fragments somewhat well sorted layer of black material at 1.7" | 2 | SP | 6.8 | <4 | 24 | 7 | 20 | 78 | 130 | 20 | Dow |
| RH-158+00-IC-NE | 10/7/2006 | 0.7-1.7 Lab Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand noncohesive, subrounded grains few angular glossy black coarse sand few shell fragments somewhat well sorted layer of black material at 1.7" | 2 | SP | 6.6 | <4 | 28 | 12 | 17 | 46 | 100 | 16 | Dow |
| RH-158+00-IC-NE | 10/7/2006 | 1.7-2.0 | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains few angular glossy black coarse sand few shell fragments black material layer at 2.0' somewhat well sorted | 3 | SP | 19.1 | <4 | 10 | <4 | 7 | 19 | 36* | <10 * | Dow |
| RH-158+00-IC-NE | 10/7/2006 | 2.0-2.5 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, medium sand noncohesive, subrounded grains few coarse sand, very few fine gravel very few shell fragments few angular glossy black coarse sand black material layer at 2.4'-2.5' somewhat well sorted | 4 | SP | 18.3 | 8 | 93 | 43 | 79 | 360 | 580 | 86 | Dow |
| RH-158+00-IC-SW | 10/7/2006 | 0.0-1.0 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, few coarse roots, Fine and medium sand, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, black material. Layer of black material at 1.0', somewhat well sorted. | 1 | SP | 13.7 | <4 | 10 | 4 | 5 | 5 | 24* | <10 * | Dow |
| RH-158+00-IC-SW | 10/7/2006 | 1.0-1.4 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, single grain, moist, loose, Non-plastic, few very fine roots, Non-cohesive, few, very fine, fine, and medium roots, very few shell fragments. | 2 | SM | 37 | <4 | 98 | 40 | 47 | 60 | 250 | 37 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-NE20 | 10/20/2006 | 0.0-1.1 Lab Duplicate | floodplain | 10YR 3/2 very dark grayish br silty clay loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, very few fine gravel | A | ML | 13.5 | <4 | 49 | 26 | 27 | 47 | 150 | 23 | Dow |
| RH-158+00-NE20 | 10/20/2006 | 0.0-1.1 | floodplain | 10YR 3/2 very dark grayish br silty clay loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, very few fine gravel | A | ML | 34.6 | 6 | 78 | 39 | 41 | 88 | 250 | 40 | Dow |
| RH-158+00-NE20 | 10/20/2006 | 1.1-1.9 | floodplain | 10YR 3/3 dark brown sandy loam, few 7.5YR 3/2 dark brown mottle, moist, granular, moist, friable, slightly plastic, very few very fine roots | Bw | SM | 27 | 17 | 1000 | 340 | 390 | 400 | 2200 | 310 | Dow |
| RH-158+00-NE20 | 10/20/2006 | 1.9-2.8 | floodplain | 10YR 4/1 dark gray sandy loam, common 5YR 3/3 dark reddish brown mottle, wet, granular, moist, friable, slightly plastic, very few fine roots | C | SM | 20.3 | 30 | 10000 | 5200 | 4200 | 4300 | 24000 | 3200 | Dow |
| RH-158+00-NE20 | 10/20/2006 | 2.8-3.2 | floodplain | 10YR 4/3 brown sandy loam, wet, granular, moist, friable, slightly plastic, very few shell fragments | 2C | SM | 19.3 | 7 | 800 | 300 | 310 | 260 | 1700 | 240 | Dow |
| RH-158+00-NE20 | 10/20/2006 | 2.8-3.2 Lab Duplicate | floodplain | 10YR 4/3 brown sandy loam, wet, granular, moist, friable, slightly plastic, very few shell fragments | 2C | SM | 7.9 | <4 | 12 | 4 | 5 | 6 | 26* | <10* | Dow |
| RH-158+00-NE20 | 10/20/2006 | 3.2-4.4 | floodplain | 10YR 4/1 dark gray loamy fine sand, wet, granular, moist, friable, slightly plastic, common fine roots, unburnt wood at 4.3 feet | 2C2 | SM | 18.2 | 10 | 990 | 480 | 450 | 530 | 2500 | 340 | Dow |

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Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-NE70 | 10/20/2006 | 0.0-0.7 | low terrace | 10YR 3/1 very dark gray sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few fine roots, FEW FINE GRAVEL | A | SM | 14.6 | 4 | 84 | 47 | 45 | 73 | 250 | 39 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 0.7-1.3 | low terrace | 10YR 3/2 very dark grayish br loamy sand, dry, granular, dry, slightly hard, Non-plastic, few coarse roots | Bw | SM | 17.5 | 11 | 260 | 130 | 130 | 210 | 740 | 110 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 1.3-1.8 | low terrace | 10YR 3/3 dark brown loamy very fine sand, dry, subangular blocky, dry, moderately hard, Non-plastic | C | SM | 9 | 27 | 740 | 380 | 370 | 570 | 2100 | 310 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 1.8-2.8 | low terrace | 7.5YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | C2 | SM | 12.9 | 4 | 56 | 30 | 34 | 63 | 190 | 29 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 2.8-4.6 | low terrace | 7.5YR 4/4 brown loamy very fine sand, dry, subangular blocky, dry, slightly hard, Non-plastic, very few coarse roots | C3 | SM | 8.8 | <4 | 13 | 5 | 5 | 6 | 28* | <10* | Dow |
| RH-158+00-NE70 | 10/20/2006 | 4.6-5.4 | low terrace | 7.5YR 4/4 brown very fine sand, dry, single grain, dry, loose, Non-plastic, WELL SORTED | 2C | SP | 7.3 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 5.4-6.6 | low terrace | 7.5YR 4/3 brown very fine sandy loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, friable, slightly plastic, very few medium roots | 3C | SM | 12.2 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 5.4-6.6Lab Duplicate | low terrace | 7.5YR 4/3 brown very fine sandy loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, friable, slightly plastic, very few medium roots | 3C | SM | 12.5 | <4 | <4 | <6 ^{LIS_R} | <7 ^{LISR} | <14 ^{LISR} | <35 | <10 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 6.6-7.7 | low terrace | 7.5YR 4/3 brown very fine sandy loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, friable, slightly plastic, very few medium roots | 3C | SM | 17.2 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RH-158+00-NE70 | 10/20/2006 | 7.7-8.8 | low terrace | 7.5YR 4/3 brown very fine sandy loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, friable, slightly plastic, very few medium roots | 3C | SM | 17.4 | <4 | <4 | <5 ^{LIS_R} | <6 ^{LISR} | <12 ^{LISR} | <31 | <10 | Dow |

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-SW175 | 12/13/2006 | 0.0-0.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, many very fine roots | A | SM | 23.2 | 10 | 1100 | 380 | 370 | 380 | 2300 | 310 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 0.2-0.9 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay loam, <15% gravel, moist, subangular blocky, weak, moist, friable, moderately plastic, common very fine roots, fine subangular gravel | C1 | CL | 13.1 | <4 | 200 | 86 | 76 | 84 | 440 | 61 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 0.9-2.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, very few very fine roots, horizon divided for sample analysis, sand is stratified | 2C2 | SP | 6.6 | 20 | 2300 | 880 | 830 | 1000 | 5100 | 690 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 2.0-3.1 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, very few very fine roots, horizon divided for sample analysis, sand is stratified | 2C2 | SP | 8.2 | 38 | 1200 | 470 | 110 | 750 | 2600 | 310 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 3.1-4.2 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, very few very fine roots, horizon divided for sample analysis, sand is stratified | 2C2 | SP | 11 | 67 | 2200 | 680 | 690 | 1100 | 4700 | 680 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 4.2-5.4 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic, very few very fine roots | 3C3 | ML/CL | 18.3 | 53 | 6300 | 2200 | 2000 | 2100 | 13000 | 1700 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 5.4-6.9 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 4/2 dark grayish brown loamy fine sand, moist, structureless, moist, friable, Non-plastic, sandy clay loam (10YR 4/2) from 6.3-6.6' | 3C4 | SP | 12 | <4 | 140 | 45 | 42 | 37 | 260 | 36 | Alta |
| RH-158+00-SW175 | 12/13/2006 | 6.9-8.0 | intermediate terrace | 10YR 5/3 brown sandy clay, many 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, very plastic | 3C5 | CL | 15.6 | <4 | 14 | <4 | 4 | <4 | <20 * | <10 * | Alta |
| RH-158+00-SW175 | 12/13/2006 | 6.9-8.0 Lab Duplicate | intermediate terrace | 10YR 5/3 brown sandy clay, many 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, very plastic | 3C5 | CL | 15.6 | <4 | 13 | <4 | <4 | <4 | <20 * | <10 * | Alta |

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"SL" indicates sample lost during laboratory analysis.



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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-SW235 | 12/13/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, few fine roots | A | ML/CL | 31.1 | 20 | 710 | 240 | 230 | 240 | 1400 | 210 | Alta |
| RH-158+00-SW235 | 12/13/2006 | 0.2-0.5 | low terrace | 2.5Y 5/3 light olive brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, very few very fine roots, some coarse sand | C1 | CL | 20.5 | 7 | 170 | 59 | 51 | 51 | 340 | 51 | Alta |
| RH-158+00-SW235 | 12/13/2006 | 0.5-1.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, friable, moderately plastic | 2Ab | ML/CL | 14.9 | 21 | 260 | 130 | 110 | 150 | 670 | 110 | Alta |
| RH-158+00-SW235 | 12/13/2006 | 1.5-3.2 | low terrace | 10YR 5/3 brown clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic | 2C2 | CL | 11.8 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RH-158+00-SW235 | 12/13/2006 | 3.2-4.7 | low terrace | 2.5Y 4/3 olive brown sandy clay, few 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, medium subrounded and subangular gravel | 2C3 | CH | 15.7 | 6 | 120 | 45 | 42 | 46 | 260 | 40 | Alta |
| RH-158+00-SW235 | 12/13/2006 | 4.7-6.5 | low terrace | 10YR 4/3 brown sandy clay, common 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, fine subrounded and subangular gravel | 2C4 | CH | 9.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 2.1-2.5 | intermediate terrace | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | 2C3 | SP | 7.5 | <4 | 9000 | 3100 | 2800 | 2400 | 17000 | 2300 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 2.5-3.7 Field Duplicate | intermediate terrace | 10YR 2/1 black and 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, some loamy fine sand horizon divided for sample analysis | 2C4 | SP | 13.6 | <4 | 57 | 18 | 18 | 17 | 110 | 17 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 2.5-3.7 | intermediate terrace | 10YR 2/1 black and 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, some loamy fine sand horizon divided for sample analysis | 2C4 | SP | 13.2 | <4 | 95 | 35 | 37 | 30 | 200 | 29 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 3.7-4.9 | intermediate terrace | 10YR 2/1 black and 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, some loamy fine sand horizon divided for sample analysis | 2C4 | SP | 14.9 | <4 | 830 | 260 | 250 | 210 | 1600 | 210 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 4.9-6.0 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 3/2 very dark grayish br sandy clay loam, moist, structureless, moist, firm, moderately plastic, very few medium roots, horizon divided for sample analysis | 3C5 | CL | 18.8 | <4 | 25 | 7 | 7 | 5 | 44* | <10 * | Alta |
| RH-158+00-SW25 | 12/8/2006 | 6.0-7.0 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 3/2 very dark grayish br sandy clay loam, moist, structureless, moist, firm, moderately plastic, very few medium roots, horizon divided for sample analysis | 3C5 | CL | 16.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RH-158+00-SW25 | 12/8/2006 | 7.0-8.0 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 3/2 very dark grayish br sandy clay loam, moist, structureless, moist, firm, moderately plastic, very few medium roots, horizon divided for sample analysis | 3C5 | CL | 14.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-158+00-SW515 | 12/15/2006 | 0.3-0.8 | intermediate terrace | 10YR 4/3 brown sandy clay loam, <15% gravel, moist, subangular blocky, weak, moist, firm, very plastic, common very fine roots | C1 | CL | 15.1 | 9 | 31 | 14 | 14 | 18 | 86 | 20 | Alta |
| RH-158+00-SW515 | 12/15/2006 | 0.8-1.0 | intermediate terrace | 10YR 3/2 very dark grayish br loam, <15% gravel, moist, subangular blocky, moist, friable, moderately plastic, common very fine roots | 2Ab | ML/CL | 11.6 | 15 | 83 | 37 | 34 | 43 | 210 | 43 | Alta |
| RH-158+00-SW515 | 12/15/2006 | 1.0-1.8 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay, <15% gravel, moist, structureless, moist, very firm, very plastic, few very fine roots, fine and medium gravel inbedded in sandy clay matrix | 2C2 | CH | 10.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RH-158+00-SW515 | 12/15/2006 | 1.8-2.9 | intermediate terrace | 10YR 4/3 brown sandy clay, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, extremely firm, very plastic, horizon divided for sample analysis, fine and medium gravel in sandy clay matrix (glacial till/fill) | 2C3 | CH | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RH-161+50-T-NE265 | 10/31/2006 | 0.0-0.3 | tributary | 10YR 3/2 very dark grayish br loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few coarse sand very few shell fragments very few fine gravel subrounded grains | 1 | SM | 20.7 | <4 | 7 | <4 | 5 | 29 | 45* | <10* | Alta |
| RH-161+50-T-NE265 | 10/31/2006 | 0.3-0.8 | tributary | 10YR 2/1 black loamy fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, very few shell fragments very few angular glossy black coarse sand subrounded grains | 2 | SM | 19.5 | 4 | 28 | 13 | 24 | 77 | 140 | 24 | Alta |
| RH-161+50-T-NE265 | 10/31/2006 | 0.8-1.1 | tributary | 2.5Y 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, common fine gravel very few shell fragments subrounded and subangular grains | 3 | SW | 13 | 100 | 250 | 67 | 110 | 200 | 730 | 200 | Alta |
| RH-161+50-T-NE50 | 10/31/2006 | 0.0-0.3 | tributary | 2.5Y 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, few fine gravel few angular glossy black coarse sand very few shell fragments subrounded and subangular grains | 1 | SW | 19.1 | 5 | 59 | 21 | 29 | 100 | 220 | 33 | Alta |
| RH-161+50-T-NE50 | 10/31/2006 | 0.3-0.6 | tributary | 10YR 2/1 black loamy fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots, common coarse sand few fine gravel few angular glossy black coarse sand very few shell fragments subrounded grains | 2 | SM | 11.2 | 5 | 33 | 8 | 13 | 32 | 91 | 17 | Alta |
| RH-161+50-T-NE50 | 10/31/2006 | 0.6-1.0 | tributary | 2.5Y 4/2 dark grayish brown very fine sandy loam, wet, granular, moist, friable, slightly plastic, common fine roots | 3 | SM | 27.4 | 10 | 77 | 25 | 39 | 42 | 190 | 38 | Alta |
| RH-161+50-T-NE50 | 10/31/2006 | 1.0-1.5 | tributary | 10YR 4/1 dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, very few shell fragments subrounded grains | 4 | SM | 21.7 | <4 | 10 | <4 | <4 | <4 | <20* | <10* | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-162+00-IC-C | 10/7/2006 | 0.0-1.2 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few coarse roots, Fine and medium sand, noncohesive, subrounded grains, few coarse sand, very few shell fragments, very few fine gravel, very few coarse roots/black material, layer at top of core at 0.0, somewhat well sorted. | 1 | SP | 4.1 | <4 | 23 | 4 | 6 | 23 | 56 | <10 * | Dow |
| RH-162+00-IC-C | 10/7/2006 | 1.2-2.3 | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Medium loamy sand, noncohesive, subrounded grains, few coarse sand, very few shell fragments, very few fine gravel, very few angular glossy black medium and coarse sand. | 2 | SM | 15.1 | <4 | 19 | 5 | 13 | 29 | 66 | 12 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 0.0-1.0 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium roots, Fine and medium sand, noncohesive, subrounded grains, few coarse sand, very few fine gravel, few medium and coarse roots/black material, few shell fragments, somewhat well sorted. | 1 | SP | 2.8 | <4 | 19 | 7 | 14 | 28 | 68 | 12 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 1.0-1.1 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, granular, moist, friable, slightly plastic, Fine granular structure, cohesive. | 2 | SM | 10.5 | 25 | 3200 | 1300 | 1300 | 1000 | 6900 | 970 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 1.1-1.9 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, Fine and medium sand, noncohesive, subrounded grains, very few shell fragments, few angular glossy black coarse sand, somewhat well sorted. | 3 | SP | 2.9 | <4 | 49 | 25 | 24 | 82 | 180 | 26 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 1.9-2.6 | in-channel | 10YR 4/2 dark grayish brown loamy sand, wet, single grain, moist, loose, Non-plastic, Medium loamy sand, noncohesive, subrounded grains, few coarse sand, very few shell fragments, few angular glossy black coarse sand. | 4 | SM | 12.1 | <4 | 85 | 42 | 60 | 110 | 300 | 46 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 2.6-3.0 | in-channel | 10YR 4/1 dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Noncohesive, subrounded, subangular and granular grains, few fine gravel, few shell fragments, very few angular glossy black coarse sand, somewhat poorly sorted. | 5 | SW | 9.6 | 4 | 3000 | 2100 | 2000 | 2000 | 9100 | 1300 | Dow |
| RH-162+00-IC-NE | 10/7/2006 | 3.0-3.3 | in-channel | 10YR 4/1 dark gray coarse sand, wet, single grain, moist, loose, Non-plastic, Medium and coarse sand, noncohesive, subrounded grains, very few fine gravel, very few shell fragments. | 6 | SM | 13.6 | <4 | 160 | 61 | 93 | 130 | 440 | 66 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach H

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RH-162+00-IC-SW | 10/7/2006 | 0.0-0.4 | in-channel | 10YR 4/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, Fine and medium sand, noncohesive, subrounded grains, few coarse grains, few coarse sand, very few fine roots/black material, somewhat well sorted. | 1 | SP | 6.7 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RH-162+00-IC-SW | 10/7/2006 | 0.4-0.7 | in-channel | 10YR 2/1 black , wet, Wood/black material, layered, ranging in size from medium to coarse. | 2 | -- | 36 | 4 | 370 | 210 | 170 | 230 | 980 | 130 | Dow |
| RH-162+00-IC-SW | 10/7/2006 | 0.7-1.1 | in-channel | 10YR 3/1 very dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Medium and coarse sand, noncohesive, subrounded grains, few fine sand, few shell fragments, few angular glossy black coarse sand, somewhat poorly sorted. | 3 | SW | 13.5 | <4 | 92 | 52 | 37 | 210 | 390 | 29 | Dow |
| RH-162+00-IC-SW | 10/7/2006 | 1.1-1.4 | in-channel | 10YR 2/1 black , wet, Wood/black material, layered, ranging in size from medium to coarse. | 4 | -- | 38.1 | <4 | 4600 | 3600 | 2300 | 8300 | 19000 | 2300 | Dow |
| RH-162+00-NE165 | 10/20/2006 | 0.0-0.6 | floodplain | 10YR 2/1 black silt loam; dry, granular; dry, slightly hard, slightly plastic, few fine roots | A | ML | 25.7 | 290 | 780 | 980 | 780 | 1800 | 4600 | 890 | Dow |
| RH-162+00-NE165 | 10/20/2006 | 0.6-1.6 | floodplain | 10YR 3/2 very dark grayish br silty clay loam, dry, subangular blocky, dry, moderately hard, moderately plastic, very few fine roots, Few thin clay skins on ped faces. | Bt | CL | 19.5 | 20 | 1600 | 890 | 970 | 1300 | 4800 | 700 | Dow |
| RH-162+00-NE165 | 10/20/2006 | 1.6-2.5 | floodplain | 10YR 4/3 brown silt loam, few 5YR 5/6 yellowish red mottle, dry, granular, dry, moderately hard, slightly plastic, very few fine roots | C | ML | 13.8 | <4 | 23 | 11 | 17 | 19 | 69 | 13 | Dow |
| RH-162+00-NE165 | 10/20/2006 | 2.5-4.4 | floodplain | 7.5YR 4/3 brown silty clay loam, few 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic | 2C | CL | 21.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RH-162+00-NE30 | 10/20/2006 | 0.0-0.3 | intermediate terrace | 10YR 2/1 black silt loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots | A | ML | 22.3 | 30 | 790 | 360 | 490 | 760 | 2400 | 380 | Dow |
| RH-162+00-NE30 | 10/20/2006 | 0.3-1.2 | intermediate terrace | 10YR 4/1 dark gray clay loam, moist, angular blocky, moist, firm, very plastic, very few fine roots. VERY FEW FINE GRAVEL COMMON THIN CLAY SKIN ON PED FACES | Bt | CL | 12.2 | <4 | 400 | 250 | 220 | 260 | 1100 | 160 | Dow |
| RH-162+00-NE30 | 10/20/2006 | 1.2-2.5 | intermediate terrace | 10YR 4/2 dark grayish brown silty clay loam, moist, angular blocky, moist, firm, very plastic, very few fine roots | 2C | CL | 12.7 | 6 | 280 | 190 | 170 | 240 | 890 | 130 | Dow |
| RH-162+00-NE30 | 10/20/2006 | 2.5-4.0 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, moist, angular blocky, moist, very firm, very plastic | 2C | CL | 14.4 | <4 | 44 | 19 | 24 | 31 | 120 | 19 | Dow |
| RH-162+00-NE30 | 10/20/2006 | 4.0-5.5 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, moist, angular blocky, moist, very firm, very plastic | 2C | CL | 14 | <4 | 34 | 15 | 19 | 29 | 97 | 16 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-167+50-IC-C | 9/8/2006 | 0.0-0.2 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, few shell fragments, very few fine black material, well sorted | 1 | SP | 3.1 | <4 | 7 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RI-167+50-IC-C | 9/8/2006 | 0.2-1.1 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, fine gravel, somewhat well sorted | 2 | SP | 10.3 | <4 | 5 | <4 | <4 | 9 | <20 * | <10 * | Alta |
| RI-167+50-IC-C | 9/8/2006 | 1.1-1.7 | in-channel | Woodlike material, thin layering, brittle yet rubber like consistency, trace shell fragments, black material noted into other layers | 2 | -- | 56.9 | <54 | 2400 | 690 | 730 | 710 | 4500 | 630 | Alta |
| RI-167+50-IC-NE | 9/8/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, trace coarse sand, well sorted, trace shell fragments, very few medium black material | 1 | SP | 4.2 | <4 | 15 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RI-167+50-IC-NE | 9/8/2006 | 0.5-1.4 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few subangular grains, few coarse sand, few medium black material, somewhat well sorted | 2 | SP | 2.9 | <4 | 13 | <4 | 4 | 9 | 25* | <10 * | Alta |
| RI-167+50-IC-NE | 9/8/2006 | 1.4-2.2 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium and coarse black material, well sorted | 3 | SP | 7.8 | <4 | 59 | 16 | 17 | 40 | 130 | 19 | Alta |
| RI-167+50-IC-NE | 9/8/2006 | 2.2-3.0 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand, few shell fragments, common medium and coarse black material, somewhat well sorted | 4 | SP | 17 | 8 | 69 | 22 | 29 | 110 | 230 | 38 | Alta |
| RI-167+50-IC-SW | 9/8/2006 | 0.0-0.2 | in-channel | 10YR 3/4 dark yellowish brown and 10YR 2/1 black fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, trace shell fragments, well sorted | 1 | SP | 18.3 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RI-167+50-IC-SW | 9/8/2006 | 0.2-0.4 | in-channel | 10YR 3/2 very dark grayish br sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine, medium and coarse sand, noncohesive, subrounded and subangular grains, layer of black material at bottom of layer, poorly sorted | 2 | SW | 18.6 | <4 | 18 | 4 | <4 | 5 | 27* | <10 * | Alta |
| RI-167+50-IC-SW | 9/8/2006 | 0.4-0.9 | in-channel | 10YR 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand, layer of black material at top of layer 0.2' thick, layer of shells from 0.85-0.9', somewhat poorly sorted | 3 | SW | 15.6 | <4 | <4 | 18 | 11 | 33 | 62 | 10 | Alta |
| RI-167+50-IC-SW | 9/8/2006 | 0.9-1.6 | in-channel | 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand, black material layer from 1.1-1.25', somewhat well sorted | 4 | SP | 21.7 | <4 | 32 | 12 | 13 | 31 | 88 | 14 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-167+50-NE10 | 10/22/2006 | 0.0-0.3 | floodplain | 10YR 3/3 dark brown very fine sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | C | SM | 21.6 | 7 | 82 | 38 | 57 | 130 | 310 | 51 | Dow |
| RI-167+50-NE10 | 10/22/2006 | 0.3-0.9 | floodplain | 10YR 4/1 dark gray silty clay loam, <15% gravel, dry, subangular blocky, dry, moderately hard, moderately plastic, Very few fine gravel. | 2C | CL | 9.6 | 4 | 400 | 160 | 210 | 300 | 1100 | 160 | Dow |
| RI-167+50-NE10 | 10/22/2006 | 0.9-1.5 | floodplain | 10YR 3/1 very dark gray sandy clay loam, dry, angular blocky, dry, very hard, very plastic | 3C | CL | 7 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RI-167+50-SW10 | 12/12/2006 | 0.0-1.8 Field Duplicate | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots, 10YR 3/2 loamy fine sand layers from 0.2-0.3', 0.6-0.8' and 1.5-1.8' fine sand layers are likely flood deposition, no distinct A horizon | C1 | SP | 11.8 | <4 | 580 | 300 | 310 | 310 | 1500 | 210 | Dow |
| RI-167+50-SW10 | 12/12/2006 | 0.0-1.8 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots, 10YR 3/2 loamy fine sand layers from 0.2-0.3', 0.6-0.8' and 1.5-1.8' fine sand layers are likely flood deposition, no distinct A horizon | C1 | SP | 12.2 | <4 | 420 | 150 | 180 | 190 | 930 | 130 | Dow |
| RI-167+50-SW10 | 12/12/2006 | 1.8-2.8 | natural levee | 10YR 5/3 brown sand, moist, single grain, moist, loose, Non-plastic, sand interbedded with very thin layers of sandy loam, few shell fragments, few wood fragments | C2 | SW | 11 | 6 | 1600 | 800 | 740 | 710 | 3800 | 530 | Dow |
| RI-167+50-SW10 | 12/12/2006 | 2.8-4.2 | natural levee | 10YR 3/2 very dark grayish br and 10YR 3/3 dark brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, horizon divided for sample analysis borderline loam | C3 | SM | 15.8 | 8 | 1100 | 530 | 500 | 500 | 2600 | 370 | Dow |
| RI-167+50-SW10 | 12/12/2006 | 4.2-5.6 | natural levee | 10YR 3/2 very dark grayish br and 10YR 3/3 dark brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, horizon divided for sample analysis borderline loam | C3 | SM | 18.5 | <4 | 5 | <4 | <4 | <4 | <20 [*] | <10 [*] | Alta |
| RI-167+50-SW10 | 12/12/2006 | 5.6-6.8 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown loamy fine sand, moist, structureless, moist, very friable, Non-plastic, horizon divided for sample analysis | C4 | SM | 13 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-167+50-SW10 | 12/12/2006 | 5.6-6.8 Lab Duplicate | natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown loamy fine sand, moist, structureless, moist, very friable, Non-plastic, horizon divided for sample analysis | C4 | SM | 13 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-167+50-SW15 | 12/13/2006 | 3.3-4.8 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, friable, moderately plastic, very few very fine roots | C4 | ML/CL | 16.5 | <4 | 390 | 140 | 120 | 110 | 760 | 100 | Alta |
| RI-167+50-SW15 | 12/13/2006 | 4.8-5.8 | intermediate terrace | 10YR 4/4 dark yellowish brown fine sandy loam, structureless, moist, very friable, slightly plastic, few shell fragments, horizon divided for sample analysis | C5 | SM | 14.1 | <4 | 4 | <4 | <4 | <4 | <20 [*] | <10 [*] | Alta |
| RI-167+50-SW15 | 12/13/2006 | 5.8-6.8 | intermediate terrace | 10YR 4/4 dark yellowish brown fine sandy loam, structureless, moist, very friable, slightly plastic, few shell fragments, horizon divided for sample analysis | C5 | SM | 17.9 | <4 | 7 | <4 | <4 | <4 | <20 [*] | <10 [*] | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

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"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-167+50-SW270 | 12/13/2006 | 3.0-4.0 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 2/1 black fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, very few very fine roots, horizon divided for sample analysis, irregular layers of loamy sediment | C2 | SM | 16.7 | <4 | 6700 | 2800 | 2200 | 2100 | 14000 | 1800 | Alta |
| RI-167+50-SW270 | 12/13/2006 | 4.0-5.0 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 2/1 black fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, very few very fine roots, horizon divided for sample analysis, irregular layers of loamy sediment | C2 | SM | 21.5 | <4 | 180 | 62 | 51 | 56 | 350 | 47 | Alta |
| RI-167+50-SW270 | 12/13/2006 | 5.0-6.0 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 2/1 black fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, very few very fine roots, horizon divided for sample analysis, irregular layers of loamy sediment | C2 | SM | 18.8 | <4 | 96 | 23 | 21 | 21 | 160 | 23 | Alta |
| RI-172+00-IC-C | 9/8/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common coarse sand, trace shell fragments, well sorted | 1 | SP | 3.6 | <4 | 5 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RI-172+00-IC-C | 9/8/2006 | 0.5-1.8 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few shell fragments, coarse sand layer at 1.2', somewhat well sorted | 2 | SP | 3.9 | <4 | 5 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RI-172+00-IC-C | 9/8/2006 | 1.8-2.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, trace medium sand, few coarse sand, trace shell fragments, well sorted | 3 | SP | 3.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-IC-C | 9/8/2006 | 2.4-3.3 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded grains, few coarse sand, few shell fragments, well sorted | 4 | SP | 12.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-IC-C | 9/8/2006 | 3.3-3.7 | in-channel | 10YR 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, common black material medium and coarse, somewhat poorly sorted | 5 | SP | 19.8 | <4 | 120 | 51 | 39 | 100 | 310 | 41 | Alta |

NOTES:

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"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-172+00-IC-NE | 9/8/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, trace coarse sand, few shell fragments, well sorted | 1 | SP | 2.5 | <4 | 7 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RI-172+00-IC-NE | 9/8/2006 | 0.4-1.7 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 10.9 | <4 | <4 | 9 | 9 | 15 | 33* | <10 * | Alta |
| RI-172+00-IC-NE | 9/8/2006 | 0.4-1.7 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few shell fragments, somewhat well sorted Field Duplicate | 2 | SP | 11.4 | <4 | 11 | 4 | 5 | 25 | 45* | <10 * | Alta |
| RI-172+00-IC-NE | 9/8/2006 | 1.7-2.1 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few shell fragments, layer of black material 0.75-0.8', somewhat poorly sorted | 3 | SP | 14.7 | <4 | 23 | 10 | 13 | 55 | 100 | 15 | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 0.0-0.5 | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few coarse sand, very few shell fragments, well sorted | 1 | SP | 3.1 | <4 | <4 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 0.5-1.3 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, somewhat well sorted | 2 | SP | 3.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 1.3-1.5 | in-channel | Layer of wood with black material. Wood is many medium and coarse pieces, black material is layered, brittle, common with medium and coarse pieces | 3 | -- | 41 | 6 | 60 | 9 | 18 | 41 | 130 | 24 | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 1.5-2.4 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few fine gravel, somewhat well sorted Field Duplicate | 4 | SP | 5.2 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 1.5-2.4 Field Duplicate | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, common coarse sand, few fine gravel, somewhat well sorted Field Duplicate | 4 | SP | 5.2 | <4 | 6 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 2.4-3.3 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, many fine sand, somewhat poorly sorted | 5 | SW | 10.2 | <4 | 9 | <4 | <4 | 8 | <20 * | <10 * | Alta |
| RI-172+00-IC-SW | 9/9/2006 | 3.3-3.5 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, common fine sand, fine and medium gravel, few coarse black material, somewhat poorly sorted | 6 | SW | 12.9 | <4 | 15 | 5 | 5 | 19 | 44* | <10 * | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-172+00-SW15 | 12/8/2006 | 0.0-0.8 | low terrace | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | C1 | SP | 7.7 | <4 | 140 | 38 | 39 | 45 | 260 | 36 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 0.8-2.4 | low terrace | 2.5Y 3/3 dark olive brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic | 2Ab | SP | 13.5 | 8 | 890 | 380 | 350 | 430 | 2000 | 280 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 2.4-3.5 | low terrace | 2.5Y 4/3 olive brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, some coarse sand horizon divided for sample analysis | 2C2 | SW | 10.3 | <4 | 560 | 190 | 190 | 180 | 1100 | 150 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 3.5-4.6 | low terrace | 2.5Y 4/3 olive brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, some coarse sand horizon divided for sample analysis | 2C2 | SW | 9.4 | <4 | 2100 | 1100 | 860 | 990 | 5100 | 660 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 4.6-5.8 | low terrace | 10YR 4/4 dark yellowish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, horizon divided for sample analysis | 2C3 | SM | 13.5 | <4 | 9 | <4 | <4 | 4 | <20 | <10 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 5.8-6.9 | low terrace | 10YR 4/4 dark yellowish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, horizon divided for sample analysis thin layer of fine sand 6.4-6.5' | 2C3 | SM | 12.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-SW15 | 12/8/2006 | 6.9-8.0 | low terrace | 10YR 4/4 dark yellowish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, horizon divided for sample analysis layer of fine sand 7.4-7.6' | 2C3 | SM | 10.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 0.0-1.8 | floodplain | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, some organic mater mixed in | C1 | SP | 9 | <4 | 270 | 180 | 120 | 280 | 850 | 110 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 1.8-3.0 | floodplain | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, moderately plastic | 2Ab | ML/CL | 22.2 | <4 | 33 | 13 | 13 | 22 | 81 | 13 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 3.0-4.0 | floodplain | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, few interbedded layers loamy fine sand horizon divided for ananalysis | 3C2 | SP | 17.2 | <4 | 15 | 12 | 11 | 21 | 59 | 10 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 4.0-5.1 Field Duplicate | floodplain | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, few interbedded layers loamy fine sand horizon divided for ananalysis | 3C2 | SP | 18.5 | <4 | 38 | 14 | 13 | 34 | 99 | 15 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 4.0-5.1 | floodplain | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, few interbedded layers loamy fine sand horizon divided for ananalysis | 3C2 | SP | 18.1 | <4 | 30 | 14 | 12 | 32 | 88 | 14 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 5.1-6.0 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, structureless, moist, very friable, slightly plastic, very few fine roots, horizon divided for sample analysis | 3C3 | SM | 22.7 | <4 | 28 | 11 | 19 | 30 | 88 | 15 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 6.0-7.0 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, structureless, moist, very friable, slightly plastic, very few fine roots, horizon divided for sample analysis | 3C3 | SM | 27.2 | 9 | 38 | 13 | 40 | 53 | 150 | 33 | Alta |
| RI-172+00-SW25 | 12/8/2006 | 7.0-8.0 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, structureless, moist, very friable, slightly plastic, very few fine roots, horizon divided for sample analysis grades into a sand | 3C3 | SM | 22.9 | 14 | 30 | 15 | 44 | 94 | 200 | 45 | Alta |

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|---|-----------------|----------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-172+00-SW290 | 12/13/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, many very fine roots | A | SM | 26.9 | 8 | 1800 | 760 | 640 | 660 | 3800 | 510 | Alta |
| RI-172+00-SW290 | 12/13/2006 | 0.3-1.9 | intermediate terrace | 10YR 3/3 dark brown fine sandy loam, <15% gravel, moist, subangular blocky, weak, moist, very friable, slightly plastic, common very fine roots, large stone at 1.6' broken up by geoprobe | Bw | SM | 15.9 | 5 | 1400 | 460 | 380 | 450 | 2600 | 340 | Alta |
| RI-172+00-SW290 | 12/13/2006 | 1.9-3.0 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, horizon divided for sample analysis | C | SM | 15.6 | 33 | 19000 | 8800 | 6200 | 7000 | 41000 | 5300 | Alta |
| RI-172+00-SW290 | 12/13/2006 | 1.9-3.0 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, horizon divided for sample analysis | C | SM | 14.8 | 29 | 15000 | 4700 | 4100 | 4000 | 28000 | 3600 | Alta |
| RI-172+00-SW290 | 12/13/2006 | 3.0-4.0 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, horizon divided for sample analysis grades to loam 3.6-4.0' | C | SM | 19.5 | <4 | 6500 | 1900 | 2000 | 1400 | 12000 | 1600 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 0.0-0.3 Lab Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, Non-plastic, common very fine roots | A | SM | 20.2 | 4 | 450 | 170 | 170 | 190 | 970 | 130 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, Non-plastic, common very fine roots | A | SM | 20.2 | 4 | 1300 | 300 | 330 | 260 | 2200 | 300 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 0.3-2.1 | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | C1 | SP | 12.1 | <4 | 580 | 340 | 260 | 330 | 1500 | 200 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 0.3-2.1 Field Duplicate | intermediate terrace | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | C1 | SP | 12.2 | <4 | 1000 | 330 | 330 | 270 | 1900 | 260 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 2.1-3.6 | intermediate terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots | C2 | SP | 14.3 | 31 | 2100 | 960 | 830 | 1100 | 5000 | 690 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 3.6-4.7 | intermediate terrace | 10YR 3/4 dark yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C3 | SP | 10.2 | <4 | 40 | 15 | 13 | 9 | 76 | 12 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 4.7-5.8 | intermediate terrace | 10YR 3/4 dark yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C3 | SP | 12.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-172+00-SW50 | 12/8/2006 | 5.8-6.9 | intermediate terrace | 10YR 3/4 dark yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis 10YR 6/3 fine sand from 5.9-6.2' | C3 | SP | 12.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-172+00-SW500 | 12/12/2006 | 0.0-0.5 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML/CL | 20.5 | 7 | 2400 | 950 | 840 | 710 | 4900 | 660 | Alta |
| RI-172+00-SW500 | 12/12/2006 | 0.5-1.3 | wetland | 10YR 5/3 brown fine sand, few 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic | C1 | SP | 9.8 | 7 | 15000 | 5100 | 4800 | 3700 | 29000 | 3900 | Alta |
| RI-172+00-SW500 | 12/12/2006 | 1.3-2.4 | wetland | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, horizon divided for sample analysis | C2 | SP | 9.9 | 9 | 5000 | 4000 | 2800 | 3500 | 15000 | 2000 | Dow |
| RI-172+00-SW500 | 12/12/2006 | 2.4-3.6 | wetland | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, horizon divided for sample analysis | C2 | SP | 13.5 | 6 | 1600 | 820 | 710 | 790 | 3900 | 530 | Dow |
| RI-172+00-SW500 | 12/12/2006 | 3.6-4.8 | wetland | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, horizon divided for sample analysis | C2 | SP | 13 | 17 | 4100 | 1900 | 1900 | 2000 | 9900 | 1400 | Dow |
| RI-172+00-SW500 | 12/12/2006 | 4.8-6.6 | wetland | 10YR 4/2 dark grayish brown clay loam, common 5YR 3/4 dark reddish brown and 7.5YR 4/6 strong brown mottle, moist, angular blocky, moist, firm, moderately plastic | C3 | CL | 16.6 | <4 | 48 | 18 | 18 | 18 | 100 | 16 | Alta |
| RI-172+00-SW500 | 12/12/2006 | 6.6-8.0 Field Duplicate | wetland | 10YR 5/2 grayish brown fine sand, few 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, fine sand is interbedded with fine sandy loam | C4 | SP | 12.9 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RI-172+00-SW500 | 12/12/2006 | 6.6-8.0 | wetland | 10YR 5/2 grayish brown fine sand, few 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, fine sand is interbedded with fine sandy loam | C4 | SP | 13.3 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RI-177+50-IC-C | 9/9/2006 | 0.0-1.0 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, very few coarse sand, very few medium black material, well sorted Field Duplicate | 1 | SP | 3.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-177+50-IC-C | 9/9/2006 | 0.0-1.0 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, very few coarse sand, very few medium black material, well sorted Field Duplicate | 1 | SP | 4 | <4 | 5 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RI-177+50-IC-C | 9/9/2006 | 1.0-1.4 | in-channel | Wood/black material - layered brittle and wood pieces | 2 | -- | 39.1 | <4 | 140 | 43 | 54 | 27 | 270 | 38 | Alta |
| RI-177+50-IC-C | 9/9/2006 | 1.4-2.3 | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, fine gravel, few shell fragments, poorly sorted | 2 | SW | 16.7 | <4 | 10 | 6 | <4 | 17 | 33* | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-177+50-IC-NE | 9/9/2006 | 0.0-0.2 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, common medium sand, few medium black material pieces, well sorted | 1 | SP | 6.4 | <4 | 12 | 12 | 9 | 14 | 46* | <10* | Alta |
| RI-177+50-IC-NE | 9/9/2006 | 0.2-0.6 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, few shell fragments, somewhat well sorted | 2 | SP | 9.6 | <4 | 10 | 4 | <4 | 6 | <20* | <10* | Alta |
| RI-177+50-IC-NE | 9/9/2006 | 0.6-1.1 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, noncohesive, few fine sand, few coarse sand, very few shell fragments, well sorted | 3 | SP | 14.2 | 12 | 23 | 19 | 11 | 27 | 92 | 23 | Alta |
| RI-177+50-IC-NE | 9/9/2006 | 1.1-1.5 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, common fine sand, fine gravel, somewhat poorly sorted | 4 | SP | 12.2 | <4 | 13 | 6 | 7 | 26 | 53 | <10* | Alta |
| RI-177+50-IC-SW | 9/9/2006 | 0.0-0.2 | in-channel | 10YR 4/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, well sorted | 1 | SP | 5.9 | <4 | <4 | <4 | <4 | 4 | <20* | <10* | Dow |
| RI-177+50-IC-SW | 9/9/2006 | 0.2-1.1 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few coarse sand, few shell fragments, medium gravel, somewhat well sorted | 2 | SP | 4 | <4 | 8 | <4 | 4 | 5 | <20* | <10* | Dow |
| RI-177+50-IC-SW | 9/9/2006 | 1.1-1.4 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, fine gravel, layer of black material at 1.1', somewhat well sorted | 3 | SP | 11.7 | <4 | 54 | 19 | 21 | 31 | 130 | 18 | Dow |
| RI-177+50-IC-SW | 9/9/2006 | 1.4-1.6 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded grains, common fine sand, very few coarse sand, well sorted | 4 | SP | 17.2 | <4 | 5 | <4 | <4 | 5 | <20* | <10* | Dow |
| RI-177+50-IC-SW | 9/9/2006 | 1.6-2.0 | in-channel | 10YR 4/1 dark gray coarse sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded and subangular grains, common fine and medium sand, somewhat well sorted | 5 | SP | 14.2 | 4 | 250 | 220 | 200 | 650 | 1300 | 180 | Dow |
| RI-177+50-IC-SW | 9/9/2006 | 2.0-2.2 | in-channel | 10YR 3/1 very dark gray sandy loam, <15% gravel, wet, granular, moist, friable, slightly plastic, cohesive, sand ranges from very fine to fine gravel | 6 | SM | 28.3 | <4 | 12 | 9 | 6 | 59 | 86 | 12 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-184+00-IC-C | 9/10/2006 | 0.0-0.5 | in-channel | 10YR 4/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very few shell fragments, very well sorted | 1 | SP | 3.4 | <4 | 5 | <4 | 4 | 59 | 68 | 11 | Dow |
| RI-184+00-IC-C | 9/10/2006 | 0.5-2.1 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sadn, noncohesive, subrounded grains, few shell fragments, well sorted, fine gravel Field Duplicate | 2 | SP | 3.3 | <4 | 6 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RI-184+00-IC-C | 9/10/2006 | 0.5-2.1 Field Duplicate | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sadn, noncohesive, subrounded grains, few shell fragments, well sorted, fine gravel Field Duplicate | 2 | SP | 3.8 | <4 | 10 | <4 | 6 | 7 | 23* | <10 * | Dow |
| RI-184+00-IC-C | 9/10/2006 | 2.1-3.2 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, few shell fragments, fine gravel, well sorted Field Duplicate | 3 | SP | 14.3 | <4 | 23 | 7 | 9 | 12 | 50* | <10 * | Dow |
| RI-184+00-IC-C | 9/10/2006 | 2.1-3.2 Field Duplicate | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, few shell fragments, fine gravel, well sorted Field Duplicate | 3 | SP | 15.7 | <4 | 12 | 4 | 6 | 11 | 32* | <10 * | Dow |
| RI-184+00-IC-NE | 9/10/2006 | 0.0-0.2 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few shell fragments, well sorted | 1 | SP | 6.4 | <4 | 24 | 6 | 6 | 6 | 42* | <10 * | Alta |
| RI-184+00-IC-NE | 9/10/2006 | 0.2-0.7 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded and subangular grains, many wood/black material medium and coarse pieces, fine gravel, very few shell fragments, somewhat well sorted | 2 | SP | 23.6 | <4 | 18 | 7 | 54 | 81 | 160 | 31 | Alta |
| RI-184+00-IC-NE | 9/10/2006 | 0.7-1.4 | in-channel | 10YR 3/1 very dark gray coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few fine sand, few medium sand, fine gravel, somewhat well sorted | 3 | SP | 15 | <4 | 5 | <4 | <4 | 5 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-184+00-IC-SW | 9/10/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown and 10YR 3/1 very dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very well sorted | 1 | SP | 17.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 0.3-2.3 | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, fine and medium sand, noncohesive, subrounded grains, well sorted Field Duplicate | 2 | SP | 16.2 | <4 | 4 | <4 | <4 | 11 | <20 * | <10 * | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 0.3-2.3 Field Duplicate | in-channel | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, fine and medium sand, noncohesive, subrounded grains, well sorted Field Duplicate | 2 | SP | 16.5 | <4 | 4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 2.3-2.7 | in-channel | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, few medium roots, noncohesive, subrounded grains | 3 | SM | 24.3 | 41 | 5200 | 4300 | 2700 | 3700 | 16000 | 2100 | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 2.7-2.9 | in-channel | 2.5Y 3/1 very dark gray silt loam, wet, subangular blocky, moist, friable, slightly plastic, cohesive, distinct layers by color | 4 | ML | 31.6 | 80 | 3900 | 1500 | 1300 | 1400 | 8200 | 1200 | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 2.9-3.3 | in-channel | 2.5Y 3/1 very dark gray very fine sandy loam, wet, granular, moist, friable, slightly plastic, cohesive, distinct layers by color, some layers predominately very fine sand | 5 | SM | 23.3 | 4 | 20 | 8 | 7 | 11 | 50* | 10* | Alta |
| RI-184+00-IC-SW | 9/10/2006 | 3.3-3.6 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very well sorted | 6 | SP | 18 | <4 | 38 | 13 | 12 | 15 | 78 | 12 | Alta |
| RI-184+00-NE10 | 10/30/2006 | 0.0-0.6 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | A | SM | 18.9 | 120 | 1400 | 720 | 620 | 1500 | 4400 | 690 | Alta |
| RI-184+00-NE10 | 10/30/2006 | 0.6-2.2 | low terrace | 10YR 3/3 dark brown loamy sand, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | AC | SM | 14.4 | 61 | 4200 | 2500 | 1800 | 3700 | 12000 | 1600 | Alta |
| RI-184+00-NE10 | 10/30/2006 | 2.2-3.1 | low terrace | 10YR 3/3 dark brown loamy sand, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots, 10YR 2/1 wood fragment at 2.7' | AC | SM | 8.2 | 4 | 18000 | 9100 | 7000 | 6700 | 41000 | 5300 | Alta |
| RI-184+00-NE10 | 10/30/2006 | 3.1-4.4 | low terrace | 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C | SP | 5.4 | 5 | 4000 | 1600 | 1600 | 1100 | 8400 | 1200 | Dow |
| RI-184+00-NE10 | 10/30/2006 | 4.4-5.5 | low terrace | 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, refusal-tree root | C | SP | 8.2 | 5 | 1300 | 490 | 510 | 510 | 2800 | 390 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-184+00-NE35 | 10/30/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, firm, moderately plastic, few fine roots, recent horizon due to construction | Aw | SM | 19.8 | 73 | 170 | 71 | 93 | 260 | 660 | 160 | Alta |
| RI-184+00-NE35 | 10/30/2006 | 0.4-2.2 | intermediate terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, very firm, moderately plastic, few fine roots, highly compacted, past slope stabilization construction FILL | -- | ML/CL | 15 | 7 | 88 | 37 | 32 | 44 | 210 | 34 | Alta |
| RI-184+00-NE35 | 10/30/2006 | 2.2-3.3 | intermediate terrace | 10YR 4/3 brown loam, dry, massive, moist, extremely firm, moderately plastic, trace plant fragments highly compacted, past slope stabilization construction FILL | -- | SM | 9.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RI-184+00-NE35 | 10/30/2006 | 3.3-4.4 | intermediate terrace | 10YR 4/3 brown loam, dry, massive, moist, extremely firm, moderately plastic, trace plant fragments highly compacted, past slope stabilization construction FILL | -- | SM | 8.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RI-184+00-NE75 | 10/30/2006 | 0.0-0.5 | high terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, firm, slightly plastic, few fine roots, 50% RECOVERY | Aw | SM | 19.1 | 44 | 33 | 14 | 26 | 79 | 200 | 69 | Alta |
| RI-184+00-NE75 | 10/30/2006 | 0.5-1.3 | high terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, highly compacted, past slope stabilization construction FILL | -- | ML/CL | 15.3 | <4 | 4 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RI-184+00-NE75 | 10/30/2006 | 1.3-2.2 | high terrace | 2.5Y 5/3 light olive brown clay loam, few 2.5Y 6/8 olive yellow mottle, <15% gravel, moist, subangular blocky, moist, very firm, moderately plastic, few fine roots, highly compacted, past slope stabilization construction FILL | -- | CL | 15.4 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RI-184+00-NE75 | 10/30/2006 | 2.2-3.3 | high terrace | 2.5Y 5/3 light olive brown clay loam, few 2.5Y 6/8 olive yellow mottle, <15% gravel, moist, subangular blocky, moist, very firm, moderately plastic, few fine roots, highly compacted, past slope stabilization construction FILL | -- | CL | 11 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RI-184+00-SW210 | 12/14/2006 | 1.0-2.0 | wetland | 10YR 4/1 dark gray and 10YR 5/1 gray silty clay, few 7.5YR 3/4 dark brown mottle, moist, subangular blocky, moist, firm, very plastic, horizon divided for sample analysis | C2 | CL | 20.6 | 20 | 170 | 74 | 56 | 89 | 410 | 71 | Alta |
| RI-184+00-SW210 | 12/14/2006 | 2.0-3.0 | wetland | 10YR 4/1 dark gray and 10YR 5/1 gray silty clay, few 7.5YR 3/4 dark brown mottle, moist, subangular blocky, moist, firm, very plastic, horizon divided for sample analysis | C2 | CL | 18.6 | <4 | 11 | 5 | <4 | 6 | 21* | <10 * | Alta |
| RI-184+00-SW210 | 12/14/2006 | 3.0-4.0 | wetland | 10YR 4/6 dark yellowish brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, very few very fine roots, horizon divided for sample analysis | C3 | CL | 18.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-184+00-SW30 | 12/8/2006 | 2.2-3.2 | natural levee | 2.5Y 3/2 very dark grayish br and 2.5Y 4/2 dark grayish brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots, interbedded fine sandy loam, loamy fine sand, and fine sand horizon divided for sample analysis | C1 | SP | 21.2 | <4 | 21 | 11 | 9 | 26 | 67 | 11 | Alta |
| RI-184+00-SW30 | 12/8/2006 | 3.2-4.2 | natural levee | 2.5Y 3/2 very dark grayish br and 2.5Y 4/2 dark grayish brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots, interbedded fine sandy loam, loamy fine sand, and fine sand horizon divided for sample analysis | C1 | SP | 20 | <4 | 110 | 40 | 42 | 70 | 270 | 37 | Alta |
| RI-184+00-SW30 | 12/8/2006 | 4.2-5.2 | natural levee | 2.5Y 3/2 very dark grayish br and 2.5Y 4/2 dark grayish brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots, interbedded fine sandy loam, loamy fine sand, and fine sand horizon divided for sample analysis | C1 | SP | 18.6 | <4 | 32 | 25 | 20 | 67 | 140 | 21 | Alta |
| RI-184+00-SW30 | 12/8/2006 | 5.2-6.2 | natural levee | 2.5Y 3/2 very dark grayish br and 2.5Y 4/2 dark grayish brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots, interbedded fine sandy loam, loamy fine sand, and fine sand horizon divided for sample analysis | C1 | SP | 29.1 | 15 | 55 | 18 | 44 | 82 | 210 | 47 | Alta |
| RI-184+00-SW30 | 12/8/2006 | 6.2-7.1 | natural levee | 2.5Y 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, common decaying wood fragments throughout horizon divided for sample analysis | Cg1 | SP | 23.5 | 24 | 57 | 19 | 28 | 76 | 200 | 51 | Alta |
| RI-184+00-SW30 | 12/8/2006 | 7.1-8.0 | natural levee | 2.5Y 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, common decaying wood fragments throughout horizon divided for sample analysis | Cg1 | SP | 19.4 | 6 | 42 | 20 | 25 | 110 | 200 | 31 | Alta |
| RI-184+00-SW45 | 12/8/2006 | 2.2-3.4 | low terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, very few very fine roots, horizon divided for sample analysis interbedded fine sandy loam, loamy fine sand, and fine sand | C1 | SM | 19.7 | 11 | 170 | 66 | 64 | 210 | 520 | 77 | Alta |
| RI-184+00-SW45 | 12/8/2006 | 3.4-4.7 | low terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, very few very fine roots, horizon divided for sample analysis interbedded fine sandy loam, loamy fine sand, and fine sand | C1 | SM | 26.6 | <4 | 38 | 12 | 12 | 33 | 95 | 14 | Alta |
| RI-184+00-SW45 | 12/8/2006 | 4.7-6.6 | low terrace | 2.5Y 5/3 light olive brown fine sand, common 10YR 5/4 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic | C2 | SP | 16 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW45 | 12/8/2006 | 6.6-7.4 | low terrace | 2.5Y 5/1 gray fine sand, wet, single grain, moist, loose, Non-plastic, few thin layers silt loam | Cg1 | SP | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW45 | 12/8/2006 | 6.6-7.4 Lab Duplicate | low terrace | 2.5Y 5/1 gray fine sand, wet, single grain, moist, loose, Non-plastic, few thin layers silt loam | Cg1 | SP | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach I

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RI-184+00-SW520 | 12/15/2006 | 0.2-1.2 | intermediate terrace | 10YR 5/3 brown clay, <15% gravel, moist, angular blocky, weak, moist, very firm, very plastic, few very fine roots, fine and medium gravel inbedded in clay matrix | C1 | CH | 12.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW520 | 12/15/2006 | 1.2-2.6 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy clay, <15% gravel, moist, angular blocky, weak, moist, very firm, very plastic, horizon divided for sample analysis fine and medium gravel inbedded in sandy clay matrix | C2 | CH | 10.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW70 | 12/8/2006 | 2.2-3.4 | intermediate terrace | 10R 4/1 dark reddish gray loam, few 10YR 4/4 dark yellowish brown mottle, moist, structureless, moist, friable, moderately plastic, Few freshwater shells. | C1 | ML/CL | 17.9 | <4 | 20 | 8 | 9 | 14 | 51 | <10 * | Alta |
| RI-184+00-SW70 | 12/8/2006 | 3.4-5.2 | intermediate terrace | 10YR 5/2 grayish brown fine sandy loam, few 10YR 5/4 yellowish brown mottle, wet, structureless, moist, friable, slightly plastic | C2 | SM | 18.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW70 | 12/8/2006 | 5.2-6.0 Lab Duplicate | intermediate terrace | 10YR 3/1 very dark gray and 10YR 4/1 dark gray fine sandy loam, wet, structureless, moist, friable, slightly plastic | C3 | SM | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RI-184+00-SW70 | 12/8/2006 | 5.2-6.0 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 4/1 dark gray fine sandy loam, wet, structureless, moist, friable, slightly plastic | C3 | SM | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-187+50-IC-C | 9/10/2006 | 0.0-0.4 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, very few coarse sand, very well sorted | 1 | SP | 3.5 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RJ-187+50-IC-C | 9/10/2006 | 0.4-3.2 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, subrounded grains, very few coarse sand, very few shell fragments, well sorted | 2 | SP | 10.6 | <4 | 12 | 6 | 8 | 27 | 54* | <10 * | Alta |
| RJ-187+50-IC-C | 9/10/2006 | 3.2-3.6 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, common fine sand, fine gravel, somewhat well sorted | 3 | SP | 16.8 | <4 | 14 | 5 | 5 | 23 | 48* | <10 * | Alta |
| RJ-187+50-IC-NE | 9/10/2006 | 0.0-0.8 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, many medium and coarse wood/black material, common shell fragments, poorly sorted | 1 | SW | 8.1 | <4 | 28 | 8 | 9 | 17 | 63 | 10 | Alta |
| RJ-187+50-IC-NE | 9/10/2006 | 0.8-1.3 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, fine gravel, somewhat well sorted | 2 | SP | 15.5 | <4 | 21 | 8 | 9 | 29 | 67 | 11 | Alta |
| RJ-187+50-IC-SW | 9/10/2006 | 0.0-1.0 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few medium sand, very well sorted | 1 | SP | 9.8 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RJ-187+50-IC-SW | 9/10/2006 | 1.0-1.8 | in-channel | 10YR 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, few shell fragments, well sorted | 2 | SP | 17.8 | <4 | 9 | <4 | <4 | 6 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-187+50-NE15 | 10/8/2006 | 0.0-0.8 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, weak, moist, very friable, non-sticky, slightly plastic, common very fine roots | A | SM | 18.5 | 40 | 1300 | 590 | 680 | 1200 | 3800 | 560 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 0.0-0.8 Lab Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, weak, moist, very friable, non-sticky, slightly plastic, common very fine roots | A | SM | 18.3 | 24 | 2100 | 680 | 910 | 1800 | 5500 | 770 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 0.8-2.4 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly sticky, slightly plastic, very few fine roots | C1 | SM | 9.7 | 10 | 7200 | 3600 | 3500 | 4800 | 19000 | 2600 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 2.4-3.8 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, structureless, dry, loose, Non-plastic, Intermittent thin layers of fine sandy loam. | C2 | SP | 6.9 | 10 | 2800 | 1300 | 1300 | 1200 | 6600 | 910 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 2.4-3.8 Lab Duplicate | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, structureless, dry, loose, Non-plastic, Intermittent thin layers of fine sandy loam. | C2 | SP | 6.3 | 12 | 2900 | 1100 | 1200 | 1100 | 6400 | 890 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 3.8-5.9 | intermediate terrace | 10YR 3/3 dark brown fine sandy loam, moist, subangular blocky, weak, moist, friable, non-sticky, slightly plastic | C3 | SM | 9 | <4 | 110 | 62 | 61 | 86 | 330 | 46 | Dow |
| RJ-187+50-NE15 | 10/8/2006 | 5.9-7.7 | intermediate terrace | 10YR 5/3 brown loamy fine sand, common 10YR 4/4 dark yellowish brown and 10YR 3/6 dark yellowish brown mottle, moist, single grain, structureless, moist, very friable, Non-plastic, very few medium roots, Texture grades into a fine sandy loam or silt loam near the bottom of the profile. | C4 | SP | 10.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RJ-187+50-NE75 | 10/8/2006 | 0.0-1.7 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, weak, moist, friable, non-sticky, slightly plastic, very few very fine roots, Texture is close to a loam. A horizon is likely cumelic as sample location is at the base of a steep slope. | A4 | SM | 15 | 14 | 200 | 110 | 120 | 240 | 680 | 110 | Dow |
| RJ-187+50-NE75 | 10/8/2006 | 1.7-3.6 | high terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown silt loam, dry, subangular blocky, weak, dry, slightly hard, moderately sticky, moderately plastic, very few very fine roots, Darker layer at 3.2-3.3, more organic matter-rich. | C1 | ML | 11.7 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RJ-187+50-NE75 | 10/8/2006 | 3.6-5.5 | high terrace | 10YR 4/3 brown silty clay loam, few 10YR 4/6 dark yellowish brown mottle, dry, angular blocky, dry, moderately hard, slightly sticky, moderately plastic | C2 | ML/CL | 12.8 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-187+50-SW10 | 12/14/2006 | 0.0-1.0 | floodplain | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, many very fine roots | A | SC | 25.1 | <4 | 23 | 11 | 10 | 25 | 68 | 11 | Alta |
| RJ-187+50-SW10 | 12/14/2006 | 1.0-2.1 Field Duplicate | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, common very fine roots, wet below 1.5' horizon divided for sample analysis | AC | SC | 20.1 | 8 | 67 | 28 | 29 | 98 | 230 | 37 | Alta |
| RJ-187+50-SW10 | 12/14/2006 | 1.0-2.1 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, common very fine roots, wet below 1.5' horizon divided for sample analysis | AC | SC | 20.2 | 8 | 100 | 39 | 41 | 180 | 370 | 54 | Alta |
| RJ-187+50-SW10 | 12/14/2006 | 2.1-3.1 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, common very fine roots, wet below 1.5' horizon divided for sample analysis | AC | SC | 22.1 | 9 | 47 | 18 | 23 | 59 | 160 | 30 | Alta |
| RJ-187+50-SW10 | 12/14/2006 | 3.1-4.0 | floodplain | 10YR 5/2 grayish brown fine sand, common 10YR 5/6 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, horizon divided for sample analysis trenditional zone around 3.1' as slightly morphized | C | SP | 17.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-187+50-SW10 | 12/14/2006 | 4.0-5.0 | floodplain | 10YR 5/2 grayish brown fine sand, common 10YR 5/6 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, horizon divided for sample analysis trenditional zone around 3.1' as slightly morphized | C | SP | 17 | <4 | 7 | 4 | <4 | 12 | 22* | <10 * | Alta |
| RJ-187+50-SW20 | 12/12/2006 | 0.0-0.7 | natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 23.4 | <4 | 120 | 52 | 50 | 78 | 300 | 42 | Dow |
| RJ-187+50-SW20 | 12/12/2006 | 0.7-2.4 | natural levee | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, few very fine roots, texture grades to fine sandy loam toward bottom of horizon | AC | SP | 16.2 | 9 | 180 | 88 | 88 | 200 | 560 | 83 | Dow |
| RJ-187+50-SW20 | 12/12/2006 | 2.4-3.8 | natural levee | 10YR 4/2 dark grayish brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis fine sandy loam and sandy clay loam from 2.4-3.2', few shell fragments | C | CL | 16.3 | <4 | 230 | 84 | 88 | 87 | 490 | 69 | Dow |
| RJ-187+50-SW20 | 12/12/2006 | 3.8-5.2 | natural levee | 10YR 4/2 dark grayish brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis few shell fragments | C | CL | 20.1 | <10 ^{LISR} | 4 | <4 | <18 ^{LISR} | <4 | <40 * | <10 * | Dow |
| RJ-187+50-SW20 | 12/12/2006 | 5.2-6.6 | natural levee | 10YR 4/2 dark grayish brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis few shell fragments | C | CL | 18.8 | <9 ^{LISR} | <4 | <16 ^{LISR} | <15 ^{LISR} | <4 | <48 | <10 | Dow |
| RJ-187+50-SW20 | 12/12/2006 | 6.6-8.0 | natural levee | 10YR 4/2 dark grayish brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis grades to fine sand at 7.0', few shell fragments | C | CL | 18.8 | <10 ^{LISR} | 20 | 6 | 5 | 4 | 35* | <10 * | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-187+50-SW35 | 12/14/2006 | 1.9-3.0 | intermediate terrace | 10YR 4/1 dark gray clay, common 10YR 4/4 dark yellowish brown and 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic, horizon divided for sample analysis | C1 | CH | 21.5 | <4 | 15 | 5 | 5 | 6 | 31* | <10* | Alta |
| RJ-187+50-SW35 | 12/14/2006 | 3.0-4.0 | intermediate terrace | 10YR 4/1 dark gray clay, common 10YR 4/4 dark yellowish brown and 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic, horizon divided for sample analysis | C1 | CH | 20.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-187+50-SW35 | 12/14/2006 | 4.0-5.0 | intermediate terrace | 10YR 4/1 dark gray clay, common 10YR 4/4 dark yellowish brown and 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic, horizon divided for sample analysis | C1 | CH | 22.4 | <4 | 6 | <4 | <4 | 4 | <20* | <10* | Alta |
| RJ-187+50-SW35 | 12/14/2006 | 5.0-5.6 | intermediate terrace | 10YR 4/1 dark gray clay, common 10YR 4/4 dark yellowish brown and 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic, horizon divided for sample analysis | C1 | CH | 20.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-192+50-IC-C | 9/10/2006 | 0.0-1.7 | in-channel | 10YR 5/3 brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium, non-cohesive, subrounded grains, very few coarse sand, very few shell fragments, well sorted | 1 | SP | 5.1 | 5 | <4 | <4 | <4 | <4 | <20* | <10* | Alta |
| RJ-192+50-IC-C | 9/10/2006 | 1.7-2.6 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, common medium roots, medium sand, non-cohesive, subrounded grains, common shell fragments, very few coarse sand, fine gravel, well sorted, roots/woody | 2 | SP | 15.5 | <4 | 17 | 7 | 7 | 27 | 57 | <10* | Alta |
| RJ-192+50-IC-NE | 9/10/2006 | 0.0-0.8 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, vcommon shell fragments, fine gravel, poorly sorted | 1 | SW | 16.8 | <4 | 86 | 29 | 25 | 34 | 180 | 24 | Alta |
| RJ-192+50-IC-NE | 9/10/2006 | 0.8-1.1 | in-channel | Layer of wood/black material, walnut, black material thinly layered, brittle, rubber like texture | 2 | -- | 8.1 | <4 | 19 | 6 | 7 | 15 | 47* | <10* | Alta |
| RJ-192+50-IC-NE | 9/10/2006 | 1.1-1.4 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, common shell fragments, fine gravel, poorly sorted, common coarse wood/black material | 3 | SW | 58.6 | 25 | 1700 | 110 | 140 | 99 | 2000 | 270 | Alta |
| RJ-192+50-IC-SW | 9/10/2006 | 0.0-0.6 | in-channel | 10YR 4/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, very few shell fragments, very few medium sand, well sorted | 1 | SP | 13.5 | 13 | <4 | <4 | <4 | 4 | <20* | <10* | Alta |
| RJ-192+50-IC-SW | 9/10/2006 | 0.6-1.5 | in-channel | 10YR 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, few shell fragments, well sorted | 2 | SP | 16.6 | 4 | <4 | <4 | <4 | <4 | <20* | <10* | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-NE15 | 10/8/2006 | 0.0-1.8 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, granular, weak, moist, very friable, non-sticky, slightly plastic, common very fine roots | A | SM | 16.5 | 45 | 1600 | 720 | 840 | 1800 | 4900 | 720 | Dow |
| RJ-192+50-NE15 | 10/8/2006 | 1.8-2.6 | intermediate terrace | 10YR 4/3 brown loamy fine sand, dry, subangular blocky, weak, dry, soft, slightly sticky, slightly plastic, very few fine roots | C1 | SP-SM | 7.5 | 9 | 6600 | 2800 | 2900 | 3200 | 15000 | 2100 | Dow |
| RJ-192+50-NE15 | 10/8/2006 | 2.6-4.2 | intermediate terrace | 10YR 5/3 brown and 10YR 4/3 brown fine sand, dry, single grain, structureless, dry, loose, non-sticky, Non-plastic, Interbedded thin layers of alternating fine sand (10YR 5/3) and fine sandy loam (10YR 4/3). | C2 | SP-SM | 6.4 | 20 | 21000 | 9300 | 9700 | 7500 | 48000 | 6700 | Dow |
| RJ-192+50-NE15 | 10/8/2006 | 4.2-5.5 | intermediate terrace | 10YR 5/3 brown very fine sand, dry, single grain, structureless, dry, loose, non-sticky, Non-plastic, very few very coarse roots, Mostly very fine sand, but some thin layers of loamy very fine sand, notably just above and below a very coarse root at 5.1 ft. | C3 | SP | 5 | <4 | 1600 | 610 | 610 | 550 | 3300 | 460 | Dow |
| RJ-192+50-NE180 | 10/8/2006 | 0.0-0.4 | high terrace | 10YR 3/2 very dark grayish br very fine sandy loam, moist, granular, weak, moist, friable, non-sticky, slightly plastic, very few very fine roots | A | SM | 20.5 | 27 | 510 | 310 | 320 | 690 | 1900 | 280 | Dow |
| RJ-192+50-NE180 | 10/8/2006 | 0.4-1.9 | high terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, weak, moist, friable, non-sticky, slightly plastic, very few very fine roots | AC | SM | 11.1 | 4 | 700 | 400 | 350 | 410 | 1900 | 260 | Dow |
| RJ-192+50-NE180 | 10/8/2006 | 1.9-2.7 | high terrace | 10YR 4/3 brown silty clay loam, moist, angular blocky, moderate, moist, firm, non-sticky, moderately plastic | C1 | ML/CL | 9.8 | <4 | 480 | 310 | 270 | 250 | 1300 | 180 | Dow |
| RJ-192+50-NE180 | 10/8/2006 | 2.7-4.1 | high terrace | 10YR 4/4 dark yellowish brown silty clay loam, moist, subangular blocky, weak, moist, firm, slightly sticky, moderately plastic, Powdery white substance at 3.8 ft in very thin layer. Could be a pulverized piece of gravel. | C2 | ML/CL | 10.7 | <4 | 23 | 11 | 11 | 11 | 56 | 10* | Dow |
| RJ-192+50-NE180 | 10/8/2006 | 4.1-5.3 | high terrace | 10YR 5/4 yellowish brown and 10YR 4/2 dark grayish brown clay, dry, massive, dry, hard, slightly sticky, very plastic, Silty clay loam near top of this horizon transitioning to a hard clay 5.3 ft. | C3 | CH | 12.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-NE50 | 10/8/2006 | 0.0-0.7 | historic natural levee | 10YR 3/2 very dark grayish br fine sand, moist, granular, weak, moist, very friable, non-sticky, Non-plastic, few fine roots. Sample collected with sampling tube and bucket auger. | A1 | SP | 16.8 | 23 | 10000 | 4900 | 4400 | 4500 | 24000 | 3300 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 0.7-1.7 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic | AC | SP | 7.1 | 58 | 64000 | 8400 | 26000 | 12000 | 110000 | 17000 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 1.7-3.3 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic | C1 | SP | 8.7 | <4 | 1400 | 490 | 510 | 350 | 2800 | 380 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 3.3-4.4 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic | C1 | SP | 4.7 | <4 | 73 | 32 | 32 | 28 | 170 | 25 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 4.4-5.5 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic | C1 | SP | 6.3 | <4 | 350 | 220 | 190 | 220 | 980 | 140 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 5.5-6.6 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic | C1 | SP | 6.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 6.6-8.0 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic, Layer of 10YR 5/4 yellowish brown sand from 7.3-7.5 ft. | C1 | SP | 6.9 | <4 | 76 | 33 | 34 | 28 | 170 | 26 | Dow |
| RJ-192+50-NE50 | 10/8/2006 | 8.0-8.8 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sandy loam, moist, subangular blocky, moist, friable, non-sticky, slightly plastic, Grades to sandy clay loam near the very bottom of the profile. | C2 | SM | 11 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 0.0-0.4 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, weak, moist, very friable, non-sticky, slightly plastic, common very fine roots | A1 | SM | 18 | 17 | 3600 | 1700 | 2000 | 2800 | 10000 | 1400 | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 0.4-1.9 | high terrace | 10YR 4/3 brown fine sand, moist, single grain, structureless, moist, loose, non-sticky, Non-plastic, Small shells at 1.8 ft. | AC | SP | 9.6 | | 18000 | 6500 | 6800 | 5300 | 36000 | 5000 | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 1.9-3.5 | high terrace | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, weak, moist, very friable, non-sticky, Non-plastic, very few coarse roots | C1 | SP | 5.6 | <4 | 390 | 140 | 150 | 150 | 840 | 120 | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 3.5-4.7 | high terrace | 10YR 3/2 very dark grayish br loamy very fine sand, moist, subangular blocky, weak, moist, very friable, non-sticky, Non-plastic, Borderline very fine sandy loam. | C2 | SP | 7.6 | <4 | 44 | 19 | 20 | 22 | 110 | 17 | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 4.7-5.5 | high terrace | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, non-sticky, Non-plastic | C3 | CL | 9.4 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RJ-192+50-NE80 | 10/8/2006 | 5.5-6.6 | high terrace | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, non-sticky, Non-plastic | C3 | CL | 10.1 | <4 | 85 | 37 | 44 | 55 | 220 | 33 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-SW15 | 12/11/2006 | 0.0-0.7 | natural levee | 2.5Y 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, many fine roots, few coarse roots, common very fine roots | A | ML/CL | 24.5 | 19 | 490 | 260 | 220 | 330 | 1300 | 190 | Alta |
| RJ-192+50-SW15 | 12/11/2006 | 0.7-1.6 | natural levee | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few very fine roots, horizon divided for sample analysis | C1 | CL | 23.8 | <4 | 97 | 49 | 41 | 43 | 230 | 32 | Alta |
| RJ-192+50-SW15 | 12/11/2006 | 1.6-2.6 | natural levee | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few very fine roots, horizon divided for sample analysis | C1 | CL | 21.9 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RJ-192+50-SW15 | 12/11/2006 | 2.6-3.6 | natural levee | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few very fine roots, horizon divided for sample analysis | C1 | CL | 23 | <4 | 6 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RJ-192+50-SW15 | 12/11/2006 | 3.6-4.6 | natural levee | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few very fine roots, horizon divided for sample analysis | C1 | CL | 20.8 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RJ-192+50-SW15 | 12/11/2006 | 4.6-5.7 | natural levee | 10YR 5/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, moderately plastic, horizon divided for sample analysis few dark mottles caused by organic matter concentrations | C2 | CL | 17.8 | <4 | <4 | <4 | <5 | <9 LISR | <26 | <10 | Dow |
| RJ-192+50-SW15 | 12/11/2006 | 5.7-6.8 | natural levee | 10YR 5/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, moderately plastic, horizon divided for sample analysis few dark mottles caused by organic matter concentrations | C2 | CL | 16.2 | <4 | <5 LISR | <6 LISR | <6 LISR | <12 LISR | <33 | <10 | Dow |
| RJ-192+50-SW15 | 12/11/2006 | 5.7-6.8 Field Duplicate | natural levee | 10YR 5/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, moderately plastic, horizon divided for sample analysis few dark mottles caused by organic matter concentrations | C2 | CL | 16.5 | <4 | <6 LISR | <7 LISR | <8 LISR | <15 LISR | <40 | <10 | Dow |
| RJ-192+50-SW15 | 12/11/2006 | 6.8-8.0 | natural levee | 10YR 5/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, moderately plastic, horizon divided for sample analysis few dark mottles caused by organic matter concentrations | C2 | CL | 19.2 | <4 | <6 LISR | <7 LISR | <8 LISR | <14 LISR | <39 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|---|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-SW150 | 12/11/2006 | 0.0-1.4 Field Duplicate | wetland | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A3 | ML/CL | 24.6 | 39 | 2400 | 1100 | 1000 | 990 | 5600 | 780 | Alta |
| RJ-192+50-SW150 | 12/11/2006 | 0.0-1.4 Field Duplicate / Lab Duplicate | wetland | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A3 | ML/CL | 24.6 | 51 | 1900 | 850 | 740 | 840 | 4300 | 630 | Alta |
| RJ-192+50-SW150 | 12/11/2006 | 0.0-1.4 | wetland | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A3 | ML/CL | 25.1 | 37 | 1400 | 610 | 520 | 640 | 3200 | 450 | Alta |
| RJ-192+50-SW150 | 12/11/2006 | 1.4-2.7 | wetland | 10YR 4/2 dark grayish brown loam, moist, angular blocky, weak, moist, friable, moderately plastic, very few very fine roots, horizon divided for sample analysis borderline clay loam | C1 | ML/CL | 23.6 | 20 | 970 | 500 | 420 | 600 | 2500 | 350 | Alta |
| RJ-192+50-SW150 | 12/11/2006 | 2.7-4.0 | wetland | 10YR 4/2 dark grayish brown loam, moist, angular blocky, weak, moist, friable, moderately plastic, very few very fine roots, horizon divided for sample analysis borderline clay loam | C1 | ML/CL | 24.6 | <4 | 23 | 11 | 11 | 12 | 57 | 10 | Dow |
| RJ-192+50-SW150 | 12/11/2006 | 2.7-4.0 Lab Duplicate | wetland | 10YR 4/2 dark grayish brown loam, moist, angular blocky, weak, moist, friable, moderately plastic, very few very fine roots, horizon divided for sample analysis borderline clay loam | C1 | ML/CL | 24.4 | <4 | 27 | 14 | 13 | 16 | 71 | 12 | Dow |
| RJ-192+50-SW150 | 12/11/2006 | 4.0-5.2 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis medium-coarse gravel | C2 | CL | 19.9 | <4 | 79 | 42 | 39 | 45 | 200 | 30 | Dow |
| RJ-192+50-SW150 | 12/11/2006 | 5.2-6.4 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis most gravel between 5.2-5.8' medium-coarse gravel | C2 | CL | 17.9 | <4 | <4 | <6 | <6 ^{LISR} | <12 ^{LISR} | <32 | <10 | Dow |
| RJ-192+50-SW150 | 12/11/2006 | 6.4-8.0 Lab Duplicate | wetland | 10YR 4/2 dark grayish brown sandy clay, many 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, fine gravel, very compacted | C3 | CH | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-192+50-SW150 | 12/11/2006 | 6.4-8.0 | wetland | 10YR 4/2 dark grayish brown sandy clay, many 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, fine gravel, very compacted | C3 | CH | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-SW25 | 12/14/2006 | 2.0-3.0 | intermediate terrace | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, horizon divided for sample analysis | C1 | ML | 22.9 | <4 | 30 | 14 | 13 | 14 | 70 | 11 | Alta |
| RJ-192+50-SW25 | 12/14/2006 | 2.0-3.0 Field Duplicate | intermediate terrace | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, horizon divided for sample analysis | C1 | ML | 24.4 | <4 | 12 | 6 | 5 | 6 | 29* | <10 * | Alta |
| RJ-192+50-SW25 | 12/14/2006 | 3.0-4.0 | intermediate terrace | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, horizon divided for sample analysis | C1 | ML | 21.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-192+50-SW25 | 12/14/2006 | 4.0-5.0 | intermediate terrace | 10YR 5/3 brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, firm, moderately plastic, horizon divided for sample analysis some black mottling from organic matter | C2 | CL | 17.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-192+50-SW40 | 12/11/2006 | 0.0-1.4 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, moderately plastic, few fine roots | A1 | ML/CL | 25.7 | 6 | 240 | 130 | 110 | 160 | 650 | 91 | Alta |
| RJ-192+50-SW40 | 12/11/2006 | 0.0-1.4 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, moderately plastic, few fine roots | A1 | ML/CL | 26.1 | 6 | 620 | 170 | 170 | 180 | 1100 | 160 | Alta |
| RJ-192+50-SW40 | 12/11/2006 | 1.4-2.2 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, moist, granular, weak, moist, friable, moderately plastic, very few very fine roots | A2 | CL | 20.8 | <4 | 6 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RJ-192+50-SW40 | 12/11/2006 | 2.2-4.0 | intermediate terrace | 10YR 5/2 grayish brown and 10YR 4/2 dark grayish brown clay loam, common 10YR 4/6 dark yellowish brown and 10YR 2/1 black mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis black mottles caused by organic matter | C1 | CL | 18 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-192+50-SW40 | 12/11/2006 | 4.0-4.9 | intermediate terrace | 10YR 5/2 grayish brown and 10YR 4/2 dark grayish brown clay loam, common 10YR 4/6 dark yellowish brown and 10YR 2/1 black mottle, moist, angular blocky, moist, firm, moderately plastic, horizon divided for sample analysis black mottles caused by organic matter | C1 | CL | 17.9 | <4 | 11 | 5 | 4 | 6 | 26* | <10 * | Dow |
| RJ-192+50-SW40 | 12/11/2006 | 4.9-5.9 | intermediate terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, moist, structureless, moist, very firm, very plastic, horizon divided for sample analysis borderline sandy clay | C2 | CH | 16 | <4 | <4 | <7 ^{LISR} | <8 ^{LISR} | <17 ^{LISR} | <40 | <10 | Dow |
| RJ-192+50-SW40 | 12/11/2006 | 5.9-6.9 | intermediate terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, moist, structureless, moist, very firm, very plastic, horizon divided for sample analysis borderline sandy clay | C2 | CH | 16.9 | <4 | <4 | <7 ^{LISR} | <7 ^{LISR} | <4 | <26 | <10 | Dow |

NOTES:

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach J

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RJ-192+50-SW80 | 12/14/2006 | 0.9-2.2 | low terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown loam, moist, subangular blocky, moist, friable, moderately plastic, few very fine roots, very thin layer of wood at 0.9' | C1 | ML/CL | 24.4 | 5 | 640 | 310 | 250 | 290 | 1500 | 200 | Alta |
| RJ-192+50-SW80 | 12/14/2006 | 2.2-4.0 | low terrace | 2.5Y 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, very firm, very plastic, few very fine roots, horizon divided for sample analysis | C2 | CH | 20.2 | <4 | 11 | 4 | 4 | 5 | 23* | <10* | Alta |
| RJ-192+50-SW80 | 12/14/2006 | 4.0-5.5 | low terrace | 2.5Y 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, very firm, very plastic, few very fine roots, horizon divided for sample analysis | C2 | CH | 17.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RJ-195+50-T-SW210 | 9/21/2006 | 0.0-0.7 | tributary | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive | 1 | SM | 55.2 | <4 | 34 | 15 | 16 | 33 | 99 | 16 | Alta |
| RJ-195+50-T-SW210 | 9/21/2006 | 0.7-1.3 | tributary | 10YR 2/1 black very fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive | 2 | SM | 44.9 | <4 | 35 | 14 | 27 | 40 | 120 | 20 | Dow |
| RJ-195+50-T-SW210 | 9/21/2006 | 1.3-1.5 | tributary | 10YR 3/1 very dark gray silt loam, wet, subangular blocky, moist, friable, slightly plastic, very few very fine roots, cohesive | 3 | SM | 37.4 | 12 | 28 | 17 | 33 | 51 | 140 | 33 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-IC-C | 9/21/2006 | 0.0-1.7 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, very few coarse sand, very few shell fragments, well sorted Field Duplicate | 1 | SP | 2.8 | <4 | 9 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RK-197+00-IC-C | 9/21/2006 | 0.0-1.7 Field Duplicate | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, very few coarse sand, very few shell fragments, well sorted Field Duplicate | 1 | SP | 2.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-197+00-IC-C | 9/21/2006 | 1.7-2.3 | in-channel | 10YR 5/3 brown sand, wet, single grain, moist, loose, Non-plastic, medium sand, non-cohesive, subrounded grains, common coarse sand, somewhat well sorted | 2 | SP | 4.6 | <4 | 11 | 4 | 4 | 4 | 24* | <10 * | Dow |
| RK-197+00-IC-C | 9/21/2006 | 2.3-2.5 | in-channel | 10YR 4/2 dark grayish brown loamy sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few coarse sand, well sorted | 3 | SP | 14.9 | <4 | 5 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RK-197+00-IC-C | 9/21/2006 | 2.5-3.4 Lab Duplicate | in-channel | 10YR 3/1 very dark gray loamy sand, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, subrounded grains, layer of coarse sand from 2.8-2.9', few shell fragments, somewhat well sorted | 4 | SP | 19 | <4 | 110 | 36 | 45 | 110 | 300 | 43 | Dow |
| RK-197+00-IC-C | 9/21/2006 | 2.5-3.4 | in-channel | 10YR 3/1 very dark gray loamy sand, wet, single grain, moist, loose, Non-plastic, few fine roots, non-cohesive, subrounded grains, layer of coarse sand from 2.8-2.9', few shell fragments, somewhat well sorted | 4 | SP | 19.5 | <4 | 140 | 65 | 62 | 170 | 430 | 59 | Dow |
| RK-197+00-IC-NE | 9/21/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, few medium roots, non-cohesive, subrounded grains, poorly sorted, point bar | 1 | SW | 3.3 | <4 | 29 | 8 | 10 | 64 | 110 | 17 | Dow |
| RK-197+00-IC-NE | 9/21/2006 | 0.3-1.1 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, few medium roots, medium sand, non-cohesive, subrounded grains, very few subangular grains, few coarse sand, few shell fragments, somewhat well sorted | 2 | SP | 4.1 | <4 | 27 | 9 | 21 | 18 | 75 | 14 | Dow |
| RK-197+00-IC-NE | 9/21/2006 | 1.1-1.4 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, fine and medium gravel, well sorted | 3 | SP | 3.9 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Dow |
| RK-197+00-IC-NE | 9/21/2006 | 1.4-2.7 Field Duplicate | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, fine gravel, somewhat well sorted Field Duplicate | 4 | SP | 15 | <4 | 29 | 5 | 10 | 17 | 61 | 10 | Dow |
| RK-197+00-IC-NE | 9/21/2006 | 1.4-2.7 | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, fine gravel, somewhat well sorted Field Duplicate | 4 | SP | 13.7 | <4 | 23 | 7 | 8 | 11 | 50* | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-IC-SW | 9/21/2006 | 0.0-0.2 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, very few coarse sand, somewhat well sorted | 1 | SP | 1.9 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-197+00-IC-SW | 9/21/2006 | 0.2-0.7 | in-channel | 10YR 4/1 dark gray loamy fine sand, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive, subrounded grains, very fine and fine roots | 2 | SM | 20.2 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RK-197+00-IC-SW | 9/21/2006 | 0.7-1.3 | in-channel | 10YR 5/1 gray loamy sand, wet, single grain, moist, loose, Non-plastic, fine and medium loamy sand, non-cohesive, subrounded grains, very few coarse sand, very few shell fragments, somewhat poorly sorted | 3 | SW | 18.3 | <4 | <4 | <4 | <4 | <9 ^{LISR} | <25 | <10 | Dow |
| RK-197+00-IC-SW | 9/21/2006 | 1.3-1.6 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, cohesive, common shell fragments | 4 | SM | 30.4 | <4 | <4 | <4 | <5 | <10 ^{LISR} | <27 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| | | | | | | | | | | | | | | | |
| RK-197+00-NE200 | 12/21/2006 | 0.0-0.3 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A | SM | 24.1 | 25 | 23000 | 9300 | 7600 | 6700 | 47000 | 6200 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 0.3-0.6 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | C1 | SP | 5.6 | 20 | 47000 | 20000 | 20000 | 16000 | 100000 | 14000 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 0.6-1.8 | high terrace | 10YR 3/3 dark brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C2 | SP | 8.7 | <4 | 4200 | 1900 | 1500 | 1400 | 9000 | 1200 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 1.8-2.9 | high terrace | 10YR 3/3 dark brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C2 | SP | 8.1 | <4 | 350 | 180 | 140 | 150 | 820 | 110 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 1.8-2.9 Lab Duplicate | high terrace | 10YR 3/3 dark brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C2 | SP | 8.1 | <4 | 380 | 200 | 160 | 170 | 910 | 120 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 2.9-4.0 | high terrace | 10YR 3/3 dark brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | C2 | SP | 10.1 | <4 | 95 | 48 | 39 | 41 | 220 | 31 | Alta |
| RK-197+00-NE200 | 12/21/2006 | 4.0-5.3 | high terrace | 10YR 3/1 very dark gray and 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, stratified sand (10YR 5/4) and sandy loam (10YR 3/1 and 10YR 4/2) sandy loam is SM, friable, slightly plastic horizon divided for sample analysis | C3 | SP | 14.8 | <4 | 17 | 10 | 7 | 7 | 41* | <10* | Alta |
| RK-197+00-NE200 | 12/21/2006 | 5.3-6.6 | high terrace | 10YR 3/1 very dark gray and 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, stratified sand (10YR 5/4) and sandy loam (10YR 3/1 and 10YR 4/2) sandy loam is SM, friable, slightly plastic horizon divided for sample analysis | C3 | SP | 16 | <4 | 13 | 5 | 4 | 5 | 27* | <10* | Alta |
| RK-197+00-NE200 | 12/21/2006 | 5.3-6.6 Lab Duplicate | high terrace | 10YR 3/1 very dark gray and 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, stratified sand (10YR 5/4) and sandy loam (10YR 3/1 and 10YR 4/2) sandy loam is SM, friable, slightly plastic horizon divided for sample analysis | C3 | SP | 16 | <4 | 16 | 7 | 5 | 5 | 33* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-NE25 | 10/31/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots | AC | SM | 17.9 | 8 | 660 | 230 | 210 | 250 | 1400 | 190 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 0.3-0.8 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 7.2 | 80 | 1100 | 420 | 370 | 380 | 2300 | 380 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 0.8-1.4 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | C2 | SM | 12.7 | 140 | 99000 | 19000 | 20000 | 13000 | 150000 | 20000 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 1.4-2.2 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots | C3 | SW | 9.2 | 30 | 110000 | 50000 | 37000 | 33000 | 230000 | 30000 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 2.2-3.3 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, slightly plastic | C4 | SP | 2.4 | 4 | 19000 | 4100 | 4700 | 2600 | 31000 | 4100 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 3.3-4.4 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, slightly plastic, 10YR 2/1 black wood fragments from 4.2-4.4' | C4 | SP | 4.3 | <4 | 11000 | 2600 | 2500 | 1500 | 17000 | 2200 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 4.4-4.9 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, slightly plastic | C4 | SP | 4.2 | <4 | 1200 | 150 | 200 | 87 | 1700 | 220 | Alta |
| RK-197+00-NE25 | 10/31/2006 | 4.9-6.6 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, few 10YR 5/8 yellowish brown mottle, wet, subangular blocky, moist, friable, slightly plastic, few coarse roots | C5 | SM | 16 | <4 | 110 | 59 | 38 | 45 | 250 | 33 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 0.0-0.3 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, common fine roots | AC3 | SM | 21.6 | 21 | 7400 | 2400 | 2100 | 2800 | 15000 | 1900 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 0.3-1.1 | high terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 7.1 | 4 | 9800 | 4200 | 3600 | 3500 | 21000 | 2800 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 1.1-2.2 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 6.7 | <4 | 73 | 31 | 32 | 32 | 170 | 25 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 2.2-3.3 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 6.3 | <4 | 50 | 23 | 22 | 27 | 120 | 19 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 3.3-3.8 | high terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 7.9 | <4 | 15 | 5 | 5 | 6 | 31* | <10* | Alta |
| RK-197+00-NE325 | 11/1/2006 | 3.8-4.9 | high terrace | 10YR 3/3 dark brown loamy sand, moist, granular, moist, friable, slightly plastic, 10YR 4/4 sand layer of 0.2' thickness, from 4.5-4.7' | C2 | SM | 10.8 | <4 | 280 | 200 | 130 | 170 | 780 | 100 | Alta |
| RK-197+00-NE325 | 11/1/2006 | 4.9-5.5 | high terrace | 10YR 3/2 very dark grayish br sandy loam, moist, subangular blocky, moist, firm, moderately plastic | C3 | SM | 11.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-NE40 | 10/31/2006 | 0.0-1.1 | low terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | AC | SM | 22.2 | 18 | 600 | 220 | 190 | 280 | 1300 | 190 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 1.1-2.2 | low terrace | 10YR 3/3 dark brown loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots, 10YR 2/1 Wood fragment 0.9-1.1' | C1 | SM | 16.1 | 180 | 1900 | 690 | 600 | 1200 | 4600 | 760 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 2.2-3.0 | low terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 12.9 | 5 | 240 | 61 | 63 | 66 | 440 | 62 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 3.0-3.3 | low terrace | 10YR 4/3 brown silt loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, few fine roots | C3 | ML | 17.3 | <4 | 5200 | 900 | 1000 | 520 | 7700 | 1000 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 3.3-4.5 | low terrace | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, 10 YR 3/1 wood fragment from 3.4-3.7' 10YR 5/8 staining at 4.3-4.4' | C4 | SP | 21 | <4 | 58 | 11 | 12 | 7 | 88 | 13 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 4.5-5.5 | low terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic, few fine roots, trace of black wood fragments at 4.5' | C5 | ML | 25.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-197+00-NE40 | 10/31/2006 | 5.5-6.6 | low terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic, few fine roots, recovery 50% | C5 | ML | 19.4 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-197+00-NE420 | 11/1/2006 | 0.0-0.7 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | AC | SM | 22 | 9 | 100 | 50 | 48 | 120 | 330 | 52 | Alta |
| RK-197+00-NE420 | 11/1/2006 | 0.7-2.2 | low terrace | 10YR 3/3 dark brown sandy loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots | C1 | SM | 17.2 | <4 | 9 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RK-197+00-NE420 | 11/1/2006 | 2.2-3.8 | low terrace | 10YR 3/4 dark yellowish brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C2 | ML | 20 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-197+00-NE420 | 11/1/2006 | 3.8-4.7 | low terrace | 10YR 5/6 yellowish brown sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 11.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-197+00-NE420 | 11/1/2006 | 4.7-5.5 | low terrace | 10YR 4/4 dark yellowish brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C4 | ML/CL | 18 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-NE5 | 10/31/2006 | 0.0-0.7 | floodplain | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots, alluvial material-recent deposition | -- | SW | 23.2 | 5 | 13 | 87 | 71 | 140 | 310 | 48 | Alta |
| RK-197+00-NE5 | 10/31/2006 | 0.7-1.5 | floodplain | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 20.9 | 24 | 680 | 220 | 210 | 340 | 1500 | 210 | Alta |
| RK-197+00-NE5 | 10/31/2006 | 1.5-2.2 | floodplain | 10YR 4/3 brown sandy loam, few 2.5YR 3/6 dark red mottle, moist, subangular blocky, moist, friable, slightly plastic, few fine roots | C2 | SM | 28.9 | 24 | 530 | 290 | 220 | 390 | 1400 | 210 | Alta |
| RK-197+00-NE5 | 10/31/2006 | 2.2-3.3 | floodplain | 10YR 4/4 dark yellowish brown sand, wet, single grain, moist, loose, Non-plastic, 10YR 2/1, black wood fragment layers between 0.05 and 0.15' throughout interval | C3 | SW | 30.3 | 29 | 300 | 100 | 97 | 180 | 710 | 120 | Alta |
| RK-197+00-NE5 | 10/31/2006 | 3.3-4.4 | floodplain | 10YR 4/4 dark yellowish brown sand, wet, single grain, moist, loose, Non-plastic, 10YR 2/1, black wood fragment layers from 4.1-4.4' trace white freshwater shells | C3 | SW | 22.8 | <4 | 10 | 7 | 5 | 8 | 30* | <10 * | Alta |
| RK-197+00-NE545 | 11/1/2006 | 0.0-0.3 | upland | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, common fine roots | Aw | SM | 23.7 | 8 | 16 | 6 | 11 | 33 | 75 | 18 | Alta |
| RK-197+00-NE545 | 11/1/2006 | 0.3-1.1 | upland | 10YR 5/6 yellowish brown clay loam, <15% gravel, dry, massive, dry, very hard, moderately plastic, FILL-highly compacted due to construction activities construction asphalt from 0.3-0.5 | -- | ML/CL | 9.3 | 4 | 5 | <4 | 5 | 17 | 30* | <10 * | Alta |
| RK-197+00-NE545 | 11/1/2006 | 1.1-2.2 | upland | 10YR 5/6 yellowish brown clay loam, <15% gravel, dry, massive, dry, very hard, moderately plastic, FILL-highly compacted due to construction activities | -- | ML/CL | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-197+00-NE70 | 11/1/2006 | 0.0-0.3 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, common fine roots | AC2 | SM | 13.4 | 41 | 4100 | 1600 | 1500 | 1700 | 9000 | 1200 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 0.3-1.1 | high terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 8.3 | 60 | 66000 | 17000 | 18000 | 110 | 100000 | 14000 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 1.1-1.7 | high terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 6.8 | 17 | 67000 | 30000 | 25000 | 20000 | 140000 | 19000 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 1.7-2.2 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 7.9 | <4 | 490 | 300 | 210 | 250 | 1200 | 160 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 2.2-3.3 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 7.5 | <4 | 330 | 110 | 95 | 87 | 620 | 83 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 3.3-4.4 | high terrace | 10YR 4/6 dark yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots, white freshwater shells at 4.3' | C2 | SP | 5.4 | <4 | 620 | 210 | 190 | 190 | 1200 | 160 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 4.4-5.7 | high terrace | 10YR 4/6 dark yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C2 | SP | 5.8 | <4 | 1100 | 520 | 390 | 400 | 2400 | 310 | Alta |
| RK-197+00-NE70 | 11/1/2006 | 5.7-6.6 | high terrace | 10YR 4/6 dark yellowish brown sandy loam, moist, subangular blocky, moist, firm, moderately plastic, 10YR 5/4 sand layers <0.1' thick | C3 | SM | 7.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-199+00-NE200 | 12/21/2006 | 0.0-0.2 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A | SM | 28 | 48 | 13000 | 9900 | 5700 | 6900 | 36000 | 4500 | Alta |
| RK-199+00-NE200 | 12/21/2006 | 0.2-1.3 | high terrace | 10YR 6/3 pale brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, stratified sediments, few layers loamy fine sand | C1 | SP | 4.9 | <7 | 11000 | 3100 | 3200 | 2100 | 19000 | 2600 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-199+00-NE200 | 12/21/2006 | 1.3-2.4 | high terrace | 10YR 6/3 pale brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, stratified sediments, few layers loamy fine sand | C1 | SP | 4.8 | 4 | 22000 | 10000 | 8100 | 6400 | 46000 | 6100 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-199+00-NE200 | 12/21/2006 | 2.4-3.5 | high terrace | 10YR 6/3 pale brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, stratified sediments, few layers loamy fine sand | C1 | SP | 7.5 | <4 | 2200 | 1100 | 830 | 820 | 4900 | 640 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-199+00-NE200 | 12/21/2006 | 3.5-5.2 | high terrace | 10YR 3/2 very dark grayish br fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, loamy fine sand 4.0-4.3' | C2 | SP | 11.4 | <4 | 73 | 34 | 30 | 27 | 160 | 24 | Alta |
| RK-199+00-NE200 | 12/21/2006 | 3.5-5.2 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, loamy fine sand 4.0-4.3' | C2 | SP | 11.6 | <4 | 43 | 19 | 17 | 19 | 97 | 15 | Alta |
| RK-199+00-NE200 | 12/21/2006 | 5.2-6.7 | high terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown loam, moist, subangular blocky, weak, moist, friable, moderately plastic, very few fine roots, borderline sandy loam | C3 | ML/CL | 17.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-199+00-NE200 | 12/21/2006 | 6.7-7.7 | high terrace | 10YR 3/4 dark yellowish brown clay loam, moist, structureless, moist, firm, moderately plastic | C4 | CL | 18.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-199+00-NE420 | 12/21/2006 | 0.0-0.3 | low terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots | A | SM | 24.9 | 67 | 11000 | 4300 | 4200 | 5300 | 25000 | 3400 | Alta |
| RK-199+00-NE420 | 12/21/2006 | 0.3-1.5 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few fine roots, horizon divided for sample analysis | C1 | SM | 18.7 | 39 | 16000 | 7000 | 6300 | 7700 | 37000 | 4900 | Alta |
| RK-199+00-NE420 | 12/21/2006 | 1.5-2.7 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, wet, subangular blocky, weak, moist, friable, slightly plastic, very few fine roots, grades toward loam below 2.0' | C1 | SM | 17 | <4 | 4200 | 2200 | 1700 | 1800 | 9900 | 1300 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-199+00-NE420 | 12/21/2006 | 2.7-3.1 | low terrace | 10YR 3/1 very dark gray loam, wet, subangular blocky, moist, friable, moderately plastic | C2 | ML/CL | 22.2 | <4 | 83 | 38 | 31 | 28 | 180 | 26 | Alta |
| RK-199+00-NE420 | 12/21/2006 | 3.1-5.5 | low terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown fine sandy loam, wet, subangular blocky, weak, moist, friable, slightly plastic, limited sample recovery; 3.3-4.4' borderline loam, layer of fine sand 5.2-5.4' | C3 | SM | 19.8 | <4 | 33 | 11 | 9 | 8 | 60 | 10 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 0.0-0.7 | low terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, moderately plastic, common fine roots | AC | SM | 18.3 | 4 | 220 | 89 | 80 | 130 | 520 | 72 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 0.7-2.6 | low terrace | | -- | -- | 9 | 19 | 1000 | 350 | 360 | 440 | 2200 | 310 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 2.6-3.3 | low terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | C2 | SM | 13.3 | 370 | 830 | 340 | 440 | 1400 | 3400 | 810 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 3.3-4.7 | low terrace | 10YR 5/3 brown sand, dry, single grain, dry, loose, Non-plastic, 10YR 2/1 plant fragments from 4.4-4.6' | C3 | SP | 9 | <4 | 2600 | 930 | 780 | 690 | 5000 | 660 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 4.7-5.5 | low terrace | 10YR 5/4 yellowish brown silt loam, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic | C4 | SM | 16.8 | <4 | 13 | 6 | 6 | 4 | 32* | <10* | Alta |
| RK-201+00-NE10 | 11/1/2006 | 5.5-6.6 | low terrace | 10YR 5/4 yellowish brown silt loam, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic | C4 | SM | 16.5 | <4 | 60 | 39 | 32 | 39 | 170 | 25 | Alta |
| RK-201+00-NE10 | 11/1/2006 | 6.6-7.4 | low terrace | 10YR 5/6 yellowish brown and 10Y 5/1 greenish gray sandy clay loam, common 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | C5 | ML | 19.4 | <4 | 6 | <4 | <4 | <4 | <20* | <10* | Alta |
| RK-201+00-NE10 | 11/1/2006 | 7.4-7.7 | low terrace | 10YR 5/6 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, trace white freshwater shells | C6 | SP | 15.9 | <4 | 20 | 10 | 9 | 7 | 46* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE25 | 11/1/2006 | 0.0-0.7 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 14.4 | 56 | 4300 | 1800 | 1600 | 2100 | 9700 | 1300 | Alta |
| RK-201+00-NE25 | 11/1/2006 | 0.7-2.2 | intermediate terrace | 10YR 4/3 brown and 10YR 3/3 dark brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 6.3 | 37 | 120000 | 81000 | 54000 | 60000 | 310000 | 40000 | Alta |
| RK-201+00-NE25 | 11/1/2006 | 2.2-3.3 | intermediate terrace | 10YR 4/3 brown and 10YR 3/3 dark brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 8.1 | 49 | 330000 | 100000 | 110000 | 78000 | 620000 | 84000 | Alta |
| RK-201+00-NE25 | 11/1/2006 | 3.3-4.4 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C2 | SP | 5.1 | 37 | 160000 | 75000 | 62000 | 50000 | 330000 | 44000 | Alta |
| RK-201+00-NE25 | 11/1/2006 | 4.4-5.9 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C2 | SP | 15 | <4 | 5300 | 2000 | 1800 | 1400 | 11000 | 1400 | Alta |
| RK-201+00-NE25 | 11/1/2006 | 5.9-6.6 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C3 | SP | 6.2 | <4 | 87 | 17 | 24 | 12 | 140 | 21 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE250 | 12/21/2006 | 0.0-0.2 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, many very fine roots | A | SM | 22.8 | 57 | 9500 | 3300 | 2800 | 2900 | 19000 | 2500 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 0.2-1.3 | high terrace | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, few small wood fragments | C1 | SP | 6.4 | 25 | 48000 | 19000 | 16000 | 12000 | 96000 | 13000 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 1.3-2.5 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, stratified 10YR 5/4, 10YR 4/4, and 10YR 3/4 fine sand in layers average 0.2-0.4' thickness some layers slightly loamy horizon divided for sample analysis | C2 | SP | 6 | <4 | 520 | 220 | 190 | 170 | 1100 | 150 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 2.5-3.7 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, stratified 10YR 5/4, 10YR 4/4, and 10YR 3/4 fine sand in layers average 0.2-0.4' thickness some layers slightly loamy horizon divided for sample analysis | C2 | SP | 6.9 | <4 | 13 | 6 | 5 | 5 | 28* | <10* | Alta |
| RK-201+00-NE250 | 12/21/2006 | 3.7-4.9 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, stratified 10YR 5/4, 10YR 4/4, and 10YR 3/4 fine sand in layers average 0.2-0.4' thickness some layers slightly loamy horizon divided for sample analysis | C2 | SP | 9.1 | <4 | 2400 | 680 | 710 | 440 | 4300 | 570 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 4.9-6.1 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, stratified 10YR 5/4, 10YR 4/4, and 10YR 3/4 fine sand in layers average 0.2-0.4' thickness some layers slightly loamy horizon divided for sample analysis | C2 | SP | 10.2 | <4 | 36 | 11 | 10 | 9 | 66 | 11 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 6.1-7.7 Field Duplicate | high terrace | 10YR 3/1 very dark gray and 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, interbedded sand and sandy loam | Cg | SP | 16.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-201+00-NE250 | 12/21/2006 | 6.1-7.7 | high terrace | 10YR 3/1 very dark gray and 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, interbedded sand and sandy loam | Cg | SP | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE425 | 11/1/2006 | 0.0-0.5 | low terrace | 10YR 2/2 very dark brown fine sandy loam, moist, granular, moist, friable, slightly plastic, few medium roots | A | SM | 20.5 | 82 | 77000 | 24000 | 20000 | 20000 | 140000 | 18000 | Alta |
| RK-201+00-NE425 | 11/1/2006 | 0.5-1.3 | low terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 7.2 | 28 | 100000 | 39000 | 36000 | 30000 | 210000 | 28000 | Alta |
| RK-201+00-NE425 | 11/1/2006 | 1.3-2.4 | low terrace | 10YR 3/2 very dark grayish br loam, few 10YR 3/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic, Borderline fine sandy loam. Horizon divided for sample analysis. | C2 | ML/CL | 13.9 | 20 | 10000 | 2700 | 2700 | 2900 | 19000 | 2400 | Alta |
| RK-201+00-NE425 | 11/1/2006 | 2.4-3.5 | low terrace | 10YR 3/2 very dark grayish br loam, few 10YR 3/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic, Borderline fine sandy loam. Slightly darker from 2.8' to 3.2'. Horizon divided for sample analysis. | C2 | ML/CL | 15.5 | 6 | 14000 | 3600 | 3500 | 2100 | 23000 | 3000 | Alta |
| RK-201+00-NE425 | 11/1/2006 | 3.5-4.2 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic | C3 | CL | 13.6 | <4 | 17 | 5 | 5 | 5 | 32* | <10* | Alta |
| RK-201+00-NE425 | 11/1/2006 | 4.2-5.0 | low terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 3.1 | <4 | 1700 | 820 | 630 | 620 | 3700 | 490 | Alta |
| RK-201+00-NE425 | 11/1/2006 | 5.0-5.5 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, firm, moderately plastic, Interbedded with fine sand (10YR 5/4). | C5 | CL | 13.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 0.0-0.6 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | ML/CL | 24.8 | 63 | 11000 | 4400 | 3500 | 5000 | 24000 | 3100 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 0.6-1.3 | wetland | 10YR 4/3 brown fine sand, few 10YR 4/4 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic | C1 | SP | 12.9 | 6 | 8800 | 3700 | 3200 | 3200 | 19000 | 2500 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 1.3-2.0 | wetland | 10YR 4/2 dark grayish brown fine sandy loam, common 10YR 4/4 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic | C2 | SM | 16.3 | <4 | 4700 | 2000 | 1700 | 1400 | 9800 | 1300 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 2.0-3.5 | wetland | 10YR 4/1 dark gray clay loam, common 10YR 3/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, firm, moderately plastic, Borderline sandy clay loam. | C3 | CL | 18.7 | <4 | 130 | 55 | 52 | 54 | 290 | 41 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 3.5-4.6 | wetland | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown sandy clay, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, very firm, very plastic | C4 | CH | 16.4 | <4 | 39 | 15 | 12 | 12 | 77 | 12 | Alta |
| RK-201+00-NE440 | 11/1/2006 | 4.6-5.5 | wetland | 10YR 3/2 very dark grayish br clay, common 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic, 2 thin layers fine sand, 4.6' and 4.8'. | C5 | CH | 18.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE580 | 11/1/2006 | 0.0-0.5 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, strong, moist, friable, slightly plastic, many very fine roots | A | ML/CL | 36.4 | 21 | 110 | 49 | 57 | 120 | 350 | 68 | Alta |
| RK-201+00-NE580 | 11/1/2006 | 0.5-1.5 | low terrace | 10YR 5/4 yellowish brown sandy clay, few 10YR 5/6 yellowish brown mottle, 15<35% gravel, moist, massive, moist, extremely firm, very plastic, very few fine roots, Contains rounded and some angular gravel. Likely fill that washed downslope from the old roadbed. | C | CH | 12.3 | <4 | 140 | 24 | 33 | 14 | 210 | 31 | Alta |
| RK-201+00-NE580 | 11/1/2006 | 1.5-2.6 | low terrace | 10YR 5/4 yellowish brown sandy clay, few 10YR 5/6 yellowish brown mottle, 15<35% gravel, moist, massive, moist, extremely firm, very plastic, very few fine roots, Contains rounded and some angular gravel. Likely fill that washed downslope from the old roadbed. | C | CH | 9.5 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-201+00-NE580 | 11/1/2006 | 2.6-3.0 | low terrace | 10YR 5/1 gray sandy clay, few 10YR 4/6 dark yellowish brown mottle, 15<35% gravel, moist, massive, moist, extremely firm, very plastic, Same as horizon above but gleyed. | Cg | CH | 8.1 | <4 | 15 | <4 | 4 | <4 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE60 | 11/1/2006 | 0.0-1.3 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, single grain, moist, loose, Non-plastic, few fine roots, <0.05" layer of 10YR 2/1 rock fragments at 1.2', rusty coloration on rock (2.5YR 3/6) | C1 | SW | 11.7 | 100 | 4400 | 1300 | 1300 | 1200 | 8300 | 1200 | Alta |
| RK-201+00-NE60 | 11/1/2006 | 1.3-2.2 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few medium roots | C2 | SP | 5.9 | 5 | 20000 | 6500 | 6200 | 4600 | 38000 | 5000 | Alta |
| RK-201+00-NE60 | 11/1/2006 | 2.2-3.3 | intermediate terrace | 10YR 4/3 brown sand, few 10YR 5/8 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few fine roots, moisture content anomaly | C3 | SP | 8.6 | 15 | 22000 | 12000 | 9000 | 9700 | 53000 | 6900 | Alta |
| RK-201+00-NE60 | 11/1/2006 | 3.3-4.4 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, trace white freshwater shells | C4 | SP | 1.7 | 15 | 86000 | 22000 | 23000 | 12000 | 140000 | 19000 | Alta |
| RK-201+00-NE60 | 11/1/2006 | 4.4-5.5 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, trace white freshwater shells plant fragments from 5.3-5.5' | C4 | SP | 3 | 7 | 38000 | 8900 | 9300 | 5600 | 61000 | 8100 | Alta |
| RK-201+00-NE60 | 11/1/2006 | 5.5-6.6 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, trace white freshwater shells plant fragments from 6.3-6.5' | C4 | SP | 3.7 | <4 | 3100 | 1400 | 1100 | 930 | 6500 | 850 | Alta |
| RK-201+00-NE60 | 11/29/2006 | 6.6-7.4 Lab Duplicate | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, Trace white freshwater shells Wood fragments from 7.0-7.4' (10YR 2/1 black) | C4 | SP | 15.8 | <4 | 710 | 240 | 250 | 180 | 1400 | 190 | Dow |
| RK-201+00-NE60 | 11/29/2006 | 6.6-7.4 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, Trace white freshwater shells Wood fragments from 7.0-7.4' (10YR 2/1 black) | C4 | SP | 15.1 | <4 | 850 | 290 | 290 | 200 | 1600 | 220 | Dow |
| RK-201+00-NE60 | 11/29/2006 | 7.4-8.3 | intermediate terrace | 10YR 5/4 yellowish brown sand, few 10YR 5/8 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Trace white freshwater shells | C4 | SP | 16.1 | <4 | 20 | 8 | 6 | 6 | 40* | <10 * | Dow |
| RK-201+00-NE60 | 11/29/2006 | 8.3-9.2 | intermediate terrace | 10YR 5/4 yellowish brown sand, few 10YR 5/8 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Trace white freshwater shells | C4 | SP | 19.7 | <4 | 88 | 38 | 35 | 30 | 190 | 28 | Dow |
| RK-201+00-NE60 | 11/29/2006 | 9.2-9.9 | intermediate terrace | 10YR 5/3 brown sand, wet, single grain, moist, loose, Non-plastic, Iron staining at C4/C5 interface (10YR 5/8). Woody plant fragments scattered throughout. | C5 | SP | 18.5 | <4 | 7 | <4 | <4 | <10 LISR | <26 * | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-201+00-NE65 | 11/1/2006 | 0.0-0.4 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moderate, moist, very friable, slightly plastic, few very fine roots | A2 | SM | 20.4 | 50 | 4100 | 1500 | 1400 | 1700 | 8700 | 1200 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 0.0-0.4 Field Duplicate | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moderate, moist, very friable, slightly plastic, few very fine roots | A2 | SM | 24.1 | 59 | 4000 | 1600 | 1500 | 1800 | 8900 | 1200 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 0.4-1.3 | high terrace | 10YR 5/4 yellowish brown and 10YR 6/4 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 6 | 11 | 24000 | 12000 | 7800 | 10000 | 54000 | 6800 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 1.3-2.2 | high terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C2 | SP | 4.7 | <4 | 3300 | 2500 | 1800 | 2400 | 9900 | 1300 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 2.2-3.3 | high terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C2 | SP | 5.8 | <4 | 56 | 24 | 20 | 25 | 130 | 19 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 3.3-4.1 | high terrace | 10YR 2/2 very dark brown fine sand, moist, single grain, moist, loose, Non-plastic | 2Ab | SP | 10 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-201+00-NE65 | 11/1/2006 | 4.1-5.0 | high terrace | 10YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. Horizon should be 2Bwb. | 2Bw | SP | 10.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-201+00-NE65 | 11/1/2006 | 5.0-6.0 | high terrace | 10YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. Horizon should be 2Bwb. | 2Bw | SP | 7 | <4 | 32 | 13 | 13 | 15 | 73 | 12 | Alta |
| RK-201+00-NE65 | 11/1/2006 | 6.0-6.8 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | 2C3 | SP | 3.1 | <4 | 24 | 10 | 9 | 9 | 52 | <10 * | Alta |
| RK-201+00-NE65 | 11/1/2006 | 6.8-7.7 | high terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | 2C4 | SP | 6.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-203+50-NE170 | 12/21/2006 | 0.0-0.3 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, many very fine roots | A | SM | 20.9 | 88 | 13000 | 5600 | 4700 | 4300 | 28000 | 3800 | Alta |
| RK-203+50-NE170 | 12/21/2006 | 0.3-1.5 | high terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, sand is stratified, color varies from 10 YR 6/3, 10YR 5/4, 10YR 4/3 horizon divided for analysis | C1 | SP | 7 | 25 | 14000 | 4700 | 5400 | 5700 | 30000 | 4200 | Alta |
| RK-203+50-NE170 | 12/21/2006 | 1.5-2.7 | high terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, sand is stratified, color varies from 10 YR 6/3, 10YR 5/4, 10YR 4/3 horizon divided for analysis | C1 | SP | 7.6 | <4 | 1800 | 780 | 610 | 630 | 3800 | 490 | Alta |
| RK-203+50-NE170 | 12/21/2006 | 2.7-4.0 | high terrace | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, few very fine roots, grades toward fine sandy loam (SM) as you go deeper horizon divided for sample analysis | C2 | SP | 14.2 | <4 | 10 | 6 | 4 | 7 | 28* | <10* | Alta |
| RK-203+50-NE170 | 12/21/2006 | 4.0-5.2 | high terrace | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, few very fine roots, grades toward fine sandy loam (SM) as you go deeper horizon divided for sample analysis | C2 | SP | 14.5 | <4 | 18 | 14 | 11 | 18 | 62 | 10 | Alta |
| RK-203+50-NE170 | 12/21/2006 | 5.2-6.6 | high terrace | 10YR 3/4 dark yellowish brown sandy loam, moist, subangular blocky, weak, moist, friable, moderately plastic, very few fine roots | C3 | SM | 14.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-203+50-NE170 | 12/21/2006 | 6.6-8.3 | high terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown loamy sand, wet, structureless, moist, very friable, Non-plastic, slightly oxidized (7.5 YR 4/6) from 8.1-8.3' | C4 | SP | 16.8 | <4 | 29 | 12 | 10 | 12 | 63 | 10* | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-203+50-NE420 | 12/21/2006 | 0.0-0.2 | low terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, many very fine roots | A | SM | 23.8 | 62 | 50000 | 29000 | 21000 | 28000 | 130000 | 17000 | Alta |
| RK-203+50-NE420 | 12/21/2006 | 0.2-1.9 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, sandier than A horizon | C1 | SM | 13.7 | 19 | 32000 | 13000 | 10000 | 9900 | 64000 | 8300 | Alta |
| RK-203+50-NE420 | 12/21/2006 | 1.9-2.3 | low terrace | 10YR 3/1 very dark gray fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots | 2Ab | SM | 20 | <4 | 560 | 260 | 210 | 220 | 1300 | 170 | Alta |
| RK-203+50-NE420 | 12/21/2006 | 2.3-3.4 | low terrace | 10YR 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, grades from sandy loam through loamy sand to sand from horizon down | 2Bw | SP | 14.8 | <4 | 18 | 6 | 5 | 5 | 35* | <10* | Alta |
| RK-203+50-NE420 | 12/21/2006 | 3.4-5.0 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/4 dark yellowish brown sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, interbedded with sandy loam and loam 4.2-4.4', 5.0-5.5', 6.2-6.6' | 2C2 | SP | 14.8 | <4 | 290 | 120 | 100 | 77 | 580 | 80 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-203+50-NE420 | 12/21/2006 | 5.0-6.6 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/4 dark yellowish brown sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, interbedded with sandy loam and loam 4.2-4.4', 5.0-5.5', 6.2-6.6' | 2C2 | SP | 15.5 | <4 | 66 | 29 | 25 | 24 | 140 | 21 | Alta |
| | | | | horizon divided for sample analysis | | | | | | | | | | | |
| RK-206+00-IC-C | 9/22/2006 | 0.0-0.5 | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, common medium roots, non-cohesive, subrounded grains, medium and coarse roots, well sorted, layer of black material at 0.5' | 1 | SP | 5.9 | <4 | 82 | 53 | 31 | 47 | 210 | 28 | Dow |
| RK-206+00-IC-C | 9/22/2006 | 0.5-1.0 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, few coarse roots, non-cohesive, subrounded grains, common fine sand, few coarse sand, very few shell fragments, somewhat well sorted | 2 | SP | 7 | <4 | 23 | 6 | 8 | 12 | 48* | <10* | Dow |
| RK-206+00-IC-C | 9/22/2006 | 1.0-1.9 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, common coarse roots, medium and coarse sand, non-cohesive, subrounded grains, fine gravel, very few shell fragments, somewhat well sorted | 2 | SP | 11.9 | 5 | 47 | 27 | 20 | 98 | 200 | 29 | Dow |

NOTES:

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"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-IC-NE | 9/22/2006 | 0.0-0.2 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, few medium roots, non-cohesive, subrounded grains, medium and coarse roots, somewhat well sorted | 1 | SP | 6 | <4 | 40 | 11 | 14 | 26 | 91 | 14 | Dow |
| RK-206+00-IC-NE | 9/22/2006 | 0.2-1.9 | in-channel | 10YR 5/2 grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, non-cohesive, subrounded grains, common shell fragments, specific layers on coarse sand and shells <0.1' thick, somewhat well sorted | 2 | SP | 5.9 | <4 | 27 | 6 | 8 | 14 | 54 | <10 * | Dow |
| RK-206+00-IC-NE | 9/22/2006 | 0.2-1.9 Field Duplicate | in-channel | 10YR 5/2 grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, non-cohesive, subrounded grains, common shell fragments, specific layers on coarse sand and shells <0.1' thick, somewhat well sorted | 2 | SP | 5.8 | <4 | 39 | 10 | 11 | 15 | 75 | 12 | Dow |
| RK-206+00-IC-NE | 9/22/2006 | 1.9-2.8 | in-channel | 10YR 4/2 dark grayish brown coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, coarse sand with fine gravel, very few medium gravel, non-cohesive, subrounded and subangular grains, few shell fragments, somewhat well sorted | 3 | SP | 5.2 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RK-206+00-IC-SW | 9/22/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, non-cohesive, subrounded grains, common medium and coarse roots/black material, few medium sand, well sorted | 1 | SP | 11.4 | <4 | 22 | 12 | 13 | 20 | 66 | 11 | Dow |
| RK-206+00-IC-SW | 9/22/2006 | 0.5-0.9 | in-channel | 10YR 4/2 dark grayish brown loamy sand, wet, single grain, moist, loose, Non-plastic, common medium roots, non-cohesive, subrounded grains, common coarse sand, common medium and coarse roots/black material, few shell fragments, somewhat poorly sorted | 2 | SW | 14.2 | 5 | 4600 | 1600 | 2000 | 1600 | 9800 | 1400 | Dow |
| RK-206+00-IC-SW | 9/22/2006 | 0.9-1.5 | in-channel | 10YR 4/1 dark gray loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few medium roots, non-cohesive, subrounded grains, few shell fragments, fine gravel somewhat poorly sorted | 3 | SW | 13.8 | <4 | 32 | 7 | 16 | 21 | 76 | 13 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-NE170 | 10/31/2006 | 0.0-0.6 | low terrace | 10YR 2/1 black fine sandy loam, moist, granular, moderate, moist, friable, slightly plastic, very few medium roots | A3 | SM | 17 | 56 | 130000 | 46000 | 29000 | 34000 | 240000 | 30000 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 0.6-2.2 | low terrace | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, Horizon divided for sample analysis. | C1 | SP | 9.6 | 17 | 85000 | 38000 | 26000 | 28000 | 180000 | 22000 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 2.2-3.5 | low terrace | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, Horizon divided for sample analysis. | C1 | SP | 9.3 | <4 | 10000 | 4400 | 3300 | 3600 | 21000 | 2800 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 3.5-4.9 | low terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, Color varies between 10YR 3/2 and 10YR 4/2. | C2 | SP | 5.2 | <4 | 160 | 44 | 42 | 34 | 280 | 38 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 4.9-6.1 | low terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, common 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C3 | SP | 5 | <4 | 290 | 110 | 97 | 92 | 590 | 80 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 6.1-7.3 | low terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, common 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C3 | SP | 6.4 | <4 | 89 | 33 | 30 | 31 | 180 | 26 | Alta |
| RK-206+00-NE170 | 10/31/2006 | 7.3-7.7 | low terrace | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 5.2 | <4 | 22 | 11 | 12 | 12 | 57 | 10 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 0.0-0.5 | low terrace | 10YR 2/1 black loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A3 | ML/CL | 17.6 | 49 | 27000 | 8900 | 6800 | 7200 | 50000 | 6400 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 0.5-1.8 | low terrace | 10YR 3/2 very dark grayish br loam, few 7.5YR 4/6 strong brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic, Horizon divided for sample analysis. | C1 | ML/CL | 12.5 | <4 | 8300 | 3400 | 2800 | 2600 | 17000 | 2200 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 1.8-3.1 | low terrace | 10YR 3/2 very dark grayish br loam, few 7.5YR 4/6 strong brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic, Horizon divided for sample analysis. | C1 | ML/CL | 15 | <4 | 58 | 25 | 19 | 23 | 130 | 18 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 3.1-4.7 | low terrace | 10YR 3/2 very dark grayish br fine sand, few 7.5YR 4/6 strong brown mottle, moist, single grain, moist, loose, Non-plastic, very few fine roots, Some loamy fine sand. | C2 | SP | 11.1 | <4 | 38 | 15 | 13 | 18 | 83 | 13 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 4.7-5.5 | low terrace | 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, slightly plastic, Horizon divided for sample analysis. Borderline sandy clay loam. | C3 | SM | 14.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-NE300 | 10/31/2006 | 5.5-7.7 | low terrace | 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, wet, structureless, moist, friable, slightly plastic, Horizon divided for sample analysis. Borderline sandy clay loam. Wet below 6.0'. | C3 | SM | 16.3 | <4 | 120 | 46 | 39 | 47 | 260 | 36 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-NE35 | 10/31/2006 | 0.0-0.3 | intermediate terrace | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, Recent flood deposition. Thin layer of organic matter at 0.2'. | -- | SP | 9 | 5 | 350 | 110 | 100 | 140 | 710 | 98 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 0.3-0.5 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, granular, weak, moist, very friable, Non-plastic, very few very fine roots, Buried by recent flood deposits. | A | SP | 15.1 | 35 | 2200 | 880 | 760 | 1000 | 4900 | 670 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 0.5-2.1 | intermediate terrace | 10YR 3/3 dark brown fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few medium roots | Bw | SP | 11.4 | 31 | 14000 | 6200 | 4500 | 4900 | 30000 | 3800 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 2.1-3.0 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, Black spots (almost black mottling) from areas rich in organic matter. Horizon divided for sample analysis. | C1 | SP | 8 | <4 | 2000 | 660 | 570 | 520 | 3800 | 490 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 3.0-4.0 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, Black spots (almost black mottling) from areas rich in organic matter. Horizon divided for sample analysis. | C1 | SP | 9.3 | <4 | 200 | 73 | 59 | 58 | 390 | 52 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 4.0-5.0 | intermediate terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, Color much lighter when dry. Horizon divided for sample analysis. | C2 | SP | 4.8 | <4 | 250 | 130 | 92 | 100 | 570 | 76 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 5.0-5.9 | intermediate terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, Color much lighter when dry. Horizon divided for sample analysis. | C2 | SP | 3.4 | <4 | 20 | 8 | 6 | 7 | 41* | <10* | Alta |
| RK-206+00-NE35 | 10/31/2006 | 5.9-6.8 | intermediate terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/6 yellowish brown and 10YR 4/6 dark yellowish brown mottle, dry, subangular blocky, weak, dry, slightly hard, moderately plastic, Alternating layers of sandy clay loam and fine sand. Sandy clay loam has more mottles but mottles increase with depth in this horizon in the sand. Horizon divided for sample analysis. | C3 | CL | 7.2 | <4 | 93 | 31 | 26 | 26 | 180 | 25 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 6.8-7.7 | intermediate terrace | 10YR 4/3 brown sandy clay loam, common 10YR 5/6 yellowish brown and 10YR 4/6 dark yellowish brown mottle, dry, subangular blocky, weak, dry, slightly hard, moderately plastic, Alternating layers of sandy clay loam and fine sand. Sandy clay loam has more mottles but mottles increase with depth in this horizon in the sand. Horizon divided for sample analysis. | C3 | CL | 9.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 7.7-8.8 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown fine sandy loam, common 7.5YR 4/6 strong brown and 7.5YR 5/8 strong brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of fine sand, fine sandy loam, and sandy clay loam. Layers of decomposing wood at 8.4' and 8.8'. Horizon divided for sample analysis. | C4 | SM | 24.2 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RK-206+00-NE35 | 10/31/2006 | 8.8-9.9 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown fine sandy loam, common 7.5YR 4/6 strong brown and 7.5YR 5/8 strong brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of fine sand, fine sandy loam, and sandy clay loam. Horizon divided for sample analysis. | C4 | SM | 17.3 | <4 | 14 | 8 | 6 | 6 | 34* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-NE35 | 10/31/2006 | 9.9-10.6 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown fine sandy loam, common 7.5YR 4/6 strong brown and 7.5YR 5/8 strong brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of fine sand, fine sandy loam, and sandy clay loam. Horizon divided for sample analysis. | C4 | SM | 16 | <4 | 37 | 15 | 12 | 15 | 80 | 13 | Alta |
| RK-206+00-NE35 | 10/31/2006 | 10.6-11.0 | intermediate terrace | 10YR 4/1 dark gray fine sandy loam, few 7.5YR 4/6 strong brown mottle, moist, structureless, moist, friable, slightly plastic, Burned piece of wood at 10.6'. | Cg | SM | 29.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-NE50 | 10/31/2006 | 0.0-0.5 Field Duplicate | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moderate, moist, very friable, Non-plastic, common very fine roots | A | SM | 20.1 | 71 | 13000 | 4600 | 3400 | 5000 | 26000 | 3400 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 0.0-0.5 | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moderate, moist, very friable, Non-plastic, common very fine roots | A | SM | 21.4 | 76 | 12000 | 4300 | 3000 | 4800 | 24000 | 3100 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 0.5-1.6 | historic natural levee | 2.5Y 3/3 dark olive brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | AC | SP | 7.9 | <4 | 2100 | 790 | 670 | 770 | 4300 | 560 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 1.6-2.2 | historic natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 3.8 | <4 | 9 | 4 | 4 | 4 | 20* | <10 * | Alta |
| RK-206+00-NE50 | 10/31/2006 | 2.2-2.7 | historic natural levee | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, weak, moist, friable, Non-plastic | 2Ab | SP | 11.4 | <6 | 150 | 64 | 64 | 77 | 360 | 52 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 2.7-3.2 | historic natural levee | 10YR 3/4 dark yellowish brown fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, Horizon is 2Bs. | 2Bs | SP | 8.7 | <4 | 8 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RK-206+00-NE50 | 10/31/2006 | 3.2-4.1 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | 2C2 | SP | 6.4 | <4 | 33 | 13 | 12 | 15 | 73 | 12 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 4.1-5.0 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | 2C2 | SP | 7.3 | <4 | 17 | 7 | 7 | 8 | 39* | <10 * | Alta |
| RK-206+00-NE50 | 10/31/2006 | 5.0-5.9 | historic natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | 2C3 | SP | 3.7 | <4 | 92 | 37 | 30 | 36 | 190 | 27 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 5.9-6.8 | historic natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | 2C3 | SP | 2.6 | <4 | 120 | 45 | 38 | 49 | 250 | 34 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 6.8-7.6 | historic natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | 2C3 | SP | 2.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 7.6-8.8 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of fine sand (10YR 5/4) and loamy fine sand (10YR 4/4). Horizon divided for sample analysis. | 2C4 | SP | 4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-NE50 | 10/31/2006 | 8.8-9.9 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of fine sand (10YR 5/4) and loamy fine sand (10YR 4/4). Horizon divided for sample analysis. | 2C4 | SP | 8.7 | <4 | 9 | 4 | <4 | 5 | <20 * | <10 * | Alta |
| RK-206+00-NE50 | 10/31/2006 | 9.9-11.0 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of fine sand (10YR 5/4) and loamy fine sand (10YR 4/4). Horizon divided for sample analysis. | 2C4 | SP | 4.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-NE515 | 11/1/2006 | 0.0-1.1 | wetland | 10YR 3/2 very dark grayish br silt loam, wet, granular, moderate, moist, friable, slightly plastic, many fine roots | A | ML/CL | 44.4 | 57 | 5700 | 2400 | 2100 | 3000 | 13000 | 1800 | Alta |
| RK-206+00-NE515 | 11/1/2006 | 1.1-1.8 | wetland | 10YR 4/2 dark grayish brown silt loam, few 10YR 4/4 dark yellowish brown mottle, wet, granular, weak, moist, friable, slightly plastic, common very fine roots | C1 | ML/CL | 29.2 | 5 | 840 | 240 | 220 | 150 | 1500 | 190 | Alta |
| RK-206+00-NE515 | 11/1/2006 | 1.8-3.3 | wetland | 10YR 5/1 gray clay loam, few 10YR 5/6 yellowish brown mottle, wet, subangular blocky, weak, moist, firm, moderately plastic, Thin layer of fine sandy loam at 3.0'. | C2 | CL | 30.2 | <4 | 240 | 96 | 79 | 95 | 510 | 68 | Alta |
| RK-206+00-NE665 | 11/1/2006 | 0.0-0.4 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML/CL | 23.9 | 44 | 1300 | 650 | 580 | 960 | 3500 | 510 | Alta |
| RK-206+00-NE665 | 11/1/2006 | 0.4-1.8 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, granular, weak, moist, friable, slightly plastic, few very fine roots | AC | SM | 14.6 | <4 | 390 | 110 | 150 | 180 | 840 | 120 | Alta |
| RK-206+00-NE665 | 11/1/2006 | 1.8-2.2 | low terrace | 10YR 4/3 brown sandy clay loam, few 10YR 4/4 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, moderately plastic | C1 | CL | 13.3 | <4 | 20 | 9 | 9 | 10 | 48* | <10* | Alta |
| RK-206+00-NE665 | 11/1/2006 | 2.2-3.3 | low terrace | 10YR 4/4 dark yellowish brown sandy clay loam, moist, subangular blocky, moist, friable, moderately plastic, Borderline fine sandy loam. | C2 | CL | 15.4 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RK-206+00-NE665 | 11/1/2006 | 3.3-4.4 | low terrace | 10YR 5/4 yellowish brown fine sand, few 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic | C3 | SP | 13.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-NE665 | 11/1/2006 | 4.4-4.8 | low terrace | 10YR 4/4 dark yellowish brown sandy clay loam, few 7.5YR 4/6 strong brown mottle, <15% gravel, wet, structureless, moist, friable, moderately plastic | C4 | CL | 14.1 | <4 | 17 | 8 | 7 | 9 | 41* | <10* | Alta |
| RK-206+00-SW120 | 12/11/2006 | 0.0-0.6 | high terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, structureless, moist, very friable, Non-plastic, few very fine roots | A | SC | 20.7 | 8 | 78 | 35 | 35 | 59 | 220 | 36 | Alta |
| RK-206+00-SW120 | 12/11/2006 | 0.6-1.1 | high terrace | 10YR 4/4 dark yellowish brown loamy fine sand, <15% gravel, moist, structureless, moist, very friable, slightly plastic, borderline fine sandy loam | C1 | SC | 12.6 | <4 | 8 | <4 | <4 | 6 | <20* | <10* | Alta |
| RK-206+00-SW120 | 12/11/2006 | 1.1-2.0 | high terrace | 10YR 5/1 gray sandy clay, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, extremely firm, very plastic, horizon divided for sample analysis Possible fill material, fine and medium subangular and angular gravel, strongly compacted | 2C2 | CH | 13.7 | <4 | 4 | <6 | <7 ^{LISR} | <4 | <25* | <10* | Dow |
| RK-206+00-SW120 | 12/11/2006 | 2.0-3.0 | high terrace | 10YR 5/1 gray sandy clay, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, extremely firm, very plastic, horizon divided for sample analysis Possible fill material, fine and medium subangular and angular gravel, strongly compacted | 2C2 | CH | 9.8 | <4 | <4 | <4 | <5 ^{LISR} | <4 | <21 | <10 | Dow |
| RK-206+00-SW120 | 12/11/2006 | 3.0-4.0 | high terrace | 10YR 5/1 gray sandy clay, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, extremely firm, very plastic, horizon divided for sample analysis Possible fill material, fine and medium subangular and angular gravel, strongly compacted | 2C2 | CH | 8.7 | <4 | 5 | <4 | <6 ^{LISR} | <11 ^{LISR} | <29* | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-SW25 | 12/11/2006 | 0.0-0.5 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SC | 22.7 | 7 | 1000 | 200 | 220 | 200 | 1600 | 220 | Alta |
| RK-206+00-SW25 | 12/11/2006 | 0.5-1.6 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots, Thin layer fine sand 0.5-0.7". Grades toward sandy clay loam. | AC | SC | 19 | 25 | 740 | 330 | 290 | 550 | 1900 | 280 | Alta |
| RK-206+00-SW25 | 12/11/2006 | 1.6-2.7 | intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, Horizon divided for sample analysis. Fine subrounded, subangular, and angular gravel. Horizon strongly compacted. Geoprobe not able to core below 6.0 feet. C horizon may be fill material. Borderline sandy clay. | C | CL | 8.8 | <4 | 29 | 17 | 13 | 19 | 78 | 12 | Dow |
| RK-206+00-SW25 | 12/11/2006 | 2.7-3.8 | intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, Horizon divided for sample analysis. Fine subrounded, subangular, and angular gravel. Horizon strongly compacted. Geoprobe not able to core below 6.0 feet. C horizon may be fill material. Borderline sandy clay. | C | CL | 7.1 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-206+00-SW25 | 12/11/2006 | 3.8-4.9 | intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, Horizon divided for sample analysis. Fine subrounded, subangular, and angular gravel. Horizon strongly compacted. Geoprobe not able to core below 6.0 feet. C horizon may be fill material. Borderline sandy clay. | C | CL | 7.6 | <4 | 31 | 17 | 16 | 22 | 85 | 14 | Dow |
| RK-206+00-SW25 | 12/11/2006 | 4.9-6.0 | intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, Horizon divided for sample analysis. Fine subrounded, subangular, and angular gravel. Horizon strongly compacted. Geoprobe not able to core below 6.0 feet. C horizon may be fill material. Borderline sandy clay. | C | CL | 6.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-SW25 | 12/11/2006 | 4.9-6.0 Lab Duplicate | intermediate terrace | 10YR 5/3 brown sandy clay loam, common 10YR 5/4 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, Horizon divided for sample analysis. Fine subrounded, subangular, and angular gravel. Horizon strongly compacted. Geoprobe not able to core below 6.0 feet. C horizon may be fill material. Borderline sandy clay. | C | CL | 6.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-206+00-SW425 | 12/15/2006 | 0.0-0.8 | upper high terrace | 2.5Y 2/1 black loam, moist, granular, moist, very friable, slightly plastic, many very fine roots | A | ML/CL | 29.1 | 18 | 9 | 5 | 8 | 19 | 60 | 26 | Alta |
| RK-206+00-SW425 | 12/15/2006 | 0.8-2.1 | upper high terrace | 2.5Y 5/3 light olive brown fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, very few very fine roots | 2C1 | SP | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-SW425 | 12/15/2006 | 0.8-2.1 Field Duplicate | upper high terrace | 2.5Y 5/3 light olive brown fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, very few very fine roots | 2C1 | SP | 14.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-206+00-SW425 | 12/15/2006 | 2.1-3.0 | upper high terrace | 2.5Y 5/1 gray sandy clay, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, very few very fine roots, horizon divided for sample analysis fine and medium gravel inbedded in sandy clay matrix | 3C2 | CH | 15.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-208+50-NE185 | 12/21/2006 | 0.0-1.6 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 14.3 | 12 | 2200 | 860 | 760 | 1000 | 4800 | 650 | Alta |
| RK-208+50-NE185 | 12/21/2006 | 0.0-1.6 Lab Duplicate | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 14.3 | 9 | 1700 | 620 | 560 | 710 | 3600 | 480 | Alta |
| RK-208+50-NE185 | 12/21/2006 | 1.6-2.6 | high terrace | 10YR 3/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis stratified fine sand (10YR 5/4) and loamy fine sand and fine sandy loam (10YR 3/4) | C1 | SP | 6.2 | <4 | 20 | 8 | 7 | 9 | 45* | <10* | Alta |
| RK-208+50-NE185 | 12/21/2006 | 2.6-3.7 | high terrace | 10YR 3/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis stratified fine sand (10YR 5/4) and loamy fine sand and fine sandy loam (10YR 3/4) | C1 | SP | 7.1 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RK-208+50-NE185 | 12/21/2006 | 3.7-4.8 | high terrace | 10YR 3/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis stratified fine sand (10YR 5/4) and loamy fine sand and fine sandy loam (10YR 3/4) | C1 | SP | 11.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-208+50-NE185 | 12/21/2006 | 4.8-5.6 | high terrace | 10YR 4/4 dark yellowish brown sandy loam, wet, subangular blocky, weak, moist, friable, slightly plastic | C2 | SM | 17.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-211+50-NE185 | 10/30/2006 | 0.0-0.3 | low terrace | 10YR 2/2 very dark brown fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | SM | 19.5 | 25 | 2200 | 1000 | 920 | 1400 | 5500 | 750 | Alta |
| RK-211+50-NE185 | 10/30/2006 | 0.3-0.8 | low terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown loamy fine sand, moist, granular, moist, very friable, Non-plastic | AB | SW | 11.4 | 10 | 2600 | 1000 | 940 | 1100 | 5600 | 760 | Alta |
| RK-211+50-NE185 | 10/30/2006 | 0.8-1.5 | low terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bw | SP | 7.9 | <4 | 260 | 100 | 92 | 93 | 540 | 74 | Alta |
| RK-211+50-NE185 | 10/30/2006 | 1.5-2.3 | low terrace | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 5.4 | <4 | 16 | 9 | 7 | 12 | 43* | <10* | Alta |
| RK-211+50-NE185 | 10/30/2006 | 2.3-3.5 | low terrace | 10YR 3/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 9.4 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RK-211+50-NE185 | 10/30/2006 | 3.5-4.4 | low terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown loamy fine sand, common 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, very friable, Non-plastic | C3 | SP | 11.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RK-211+50-NE185 | 10/30/2006 | 4.4-5.2 | low terrace | 10YR 5/4 yellowish brown fine sand, common 10YR 4/6 dark yellowish brown and 2.5YR 2/4 dark reddish brown mottle, moist, single grain, moist, loose, Non-plastic, few medium 10YR 2/1 black concretions, Black concretions 4.4 - 4.8'. | C4 | SP | 6 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RK-211+50-NE185 | 10/30/2006 | 4.4-5.2 Lab Duplicate | low terrace | 10YR 5/4 yellowish brown fine sand, common 10YR 4/6 dark yellowish brown and 2.5YR 2/4 dark reddish brown mottle, moist, single grain, moist, loose, Non-plastic, few medium 10YR 2/1 black concretions, Black concretions 4.4 - 4.8'. | C4 | SP | 5.5 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RK-211+50-NE185 | 10/30/2006 | 5.2-6.6 | low terrace | 10YR 3/2 very dark grayish br fine sand, common 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Wet below 5.9'. | C5 | SP | 15.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-211+50-NE20 | 10/30/2006 | 0.0-1.1 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin layer of organic matter at 0.5 - 0.6'. Horizon divided for sample analysis. | C1 | SP | 4.9 | <4 | 70 | 24 | 28 | 56 | 180 | 26 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 1.1-2.7 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C1 | SP | 4 | <4 | 40 | 19 | 15 | 44 | 120 | 17 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 2.7-3.1 | natural levee | 10YR 6/3 pale brown and 10YR 2/1 black fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of fine sand and organic matter. May have been incipient A horizon. | C2 | SP | 10 | 11 | 370 | 160 | 160 | 470 | 1200 | 160 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 3.1-4.7 | natural levee | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 7.7 | 35 | 1400 | 640 | 570 | 1200 | 3700 | 520 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 4.7-5.5 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, Thin layers of organic matter at 4.8' and 5.5'. Horizon divided for sample analysis. | C4 | SP | 3.1 | 51 | 8300 | 3600 | 3000 | 3900 | 19000 | 2500 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 5.5-6.4 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, Thin layers of organic matter at 6.0', 6.2', and 6.3'. Horizon divided for sample analysis. | C4 | SP | 2.8 | 11 | 8200 | 4500 | 990 | 5200 | 19000 | 2000 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 6.4-7.0 | natural levee | 10YR 3/2 very dark grayish br loamy fine sand, dry, subangular blocky, weak, dry, slightly hard, Non-plastic | C5 | SP | 7.7 | <8 | 17000 | 7100 | 6000 | 7100 | 37000 | 4800 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 7.0-7.7 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | C6 | SP | 1.2 | 6 | 35000 | 13000 | 12000 | 9600 | 70000 | 9200 | Alta |
| RK-211+50-NE20 | 10/30/2006 | 7.7-8.9 | natural levee | 10YR 4/2 dark grayish brown very fine sandy loam, dry, subangular blocky, weak, dry, soft, slightly plastic | C7 | SW-SM | 5.4 | 13 | 19000 | 6500 | 7200 | 5100 | 37000 | 5200 | Dow |
| RK-211+50-NE20 | 10/30/2006 | 8.9-10.2 | natural levee | 10YR 5/4 yellowish brown very fine sand, dry, single grain, dry, loose, Non-plastic | C8 | SP | 4.3 | <4 | 1500 | 490 | 570 | 400 | 3000 | 420 | Dow |
| RK-211+50-NE20 | 10/30/2006 | 10.2-11.0 | natural levee | 10YR 4/2 dark grayish brown and 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, very friable, slightly plastic, very few coarse roots, Higher silt content than other horizons at this location. | C9 | SP-SM | 13.2 | <4 | 22 | 7 | 7 | 5 | 42* | <10* | Dow |
| RK-211+50-NE220 | 10/25/2006 | 0.0-0.2 | wetland | 10YR 2/1 black silt loam, moist, granular, moist, friable, slightly plastic, many fine roots | A | ML | 50.4 | 37 | 4500 | 2000 | 1800 | 2500 | 11000 | 1500 | Alta |
| RK-211+50-NE220 | 10/25/2006 | 0.2-2.2 | wetland | 10YR 4/2 dark grayish brown fine sandy loam, few 10YR 4/4 dark yellowish brown mottle, wet, structureless, moist, friable, slightly plastic, common very fine roots, few freshwater shells, very little sample recovery due to saturation. | Cg | SM | 24 | 4 | 1100 | 490 | 430 | 460 | 2500 | 340 | Alta |

NOTES:

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DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-211+50-NE45 | 10/30/2006 | 0.0-0.6 | historic natural levee | 10YR 2/1 black fine sand, dry, granular, moderate, dry, soft, Non-plastic, common very fine roots, Very thin layer of clean sand at 0.2'. | A5 | SP | 17.5 | 88 | 14000 | 6900 | 5600 | 5800 | 32000 | 4300 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 0.6-2.2 | historic natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, 10YR 5/4 fine sand from 1.8 - 2.1'. Horizon divided for sample analysis. | C1 | SP | 5.9 | <4 | 680 | 330 | 270 | 280 | 1600 | 210 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 2.2-3.3 | historic natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, Horizon divided for sample analysis. | C1 | SP | 6.7 | <4 | 970 | 550 | 410 | 440 | 2400 | 310 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 3.3-4.4 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of 10YR 5/4 and 10YR 4/4 fine sand. Horizon divided for sample analysis. | C2 | SP | 5.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 4.4-5.5 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of 10YR 5/4 and 10YR 4/4 fine sand. Horizon divided for sample analysis. | C2 | SP | 3.2 | <4 | 31 | 17 | 14 | 15 | 78 | 11 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 5.5-7.0 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Alternating layers of 10YR 5/4 and 10YR 4/4 fine sand. Horizon divided for sample analysis. | C2 | SP | 3.2 | <4 | 8 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RK-211+50-NE45 | 10/30/2006 | 7.0-8.0 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 3/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Alternating layers of fine sand (10YR 5/4) and fine sandy loam (10YR 3/6). Horizon divided for sample analysis. | C5 | SP | 5.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-211+50-NE45 | 10/30/2006 | 8.0-9.1 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 3/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Alternating layers of fine sand (10YR 5/4) and fine sandy loam (10YR 3/6). Horizon divided for sample analysis. | C5 | SP | 5.8 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-211+50-NE45 | 10/30/2006 | 9.1-10.2 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C6 | SP | 4.9 | <4 | 15 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-211+50-NE45 | 10/30/2006 | 10.2-11.0 | historic natural levee | 10YR 4/3 brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, Layer of 10YR 5/4 fine sand from 10.4 - 10.5'. | C7 | SC | 9.4 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-211+50-NE555 | 10/21/2006 | 0.0-0.3 | wetland | 10YR 3/1 very dark gray silt loam, moist, granular, moist, very friable, slightly plastic, few very fine roots | A | ML | 36.7 | 23 | 2200 | 1200 | 1100 | 1500 | 6000 | 830 | Dow |
| RK-211+50-NE555 | 10/21/2006 | 0.0-0.3 Lab Duplicate | wetland | 10YR 3/1 very dark gray silt loam, moist, granular, moist, very friable, slightly plastic, few very fine roots | A | ML | 51.2 | 37 | 3800 | 1700 | 1700 | 2100 | 9300 | 1300 | Dow |
| RK-211+50-NE555 | 10/21/2006 | 0.3-2.2 | wetland | 10YR 4/1 dark gray and 10YR 5/1 gray silty clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, firm, very plastic, Wood fragments at 0.5' and 1.8'. | Cg | CL | 23.3 | 10 | 2300 | 1200 | 1100 | 1200 | 5800 | 790 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-211+50-NE645 | 10/21/2006 | 0.0-1.2 | low terrace | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common very fine roots, Single fock fragment at 0.9'. | A | SM | 19.8 | 15 | 550 | 310 | 320 | 490 | 1700 | 250 | Dow |
| RK-211+50-NE645 | 10/21/2006 | 1.2-2.2 | low terrace | 10YR 4/3 brown and 10YR 4/1 dark gray loam, common 10YR 4/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, moist, angular blocky, moderate, moist, friable, slightly plastic, Borderline sandy clay loam. | Cg | SM | 15.6 | <4 | 13 | 8 | 7 | 10 | 37* | <10 * | Dow |
| RK-211+50-NE645 | 10/21/2006 | 2.2-3.3 | low terrace | 10YR 4/3 brown and 10YR 4/1 dark gray loam, common 10YR 4/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, moist, angular blocky, moderate, moist, friable, slightly plastic, Borderline sandy clay loam. | Cg | SM | 13.9 | <4 | 6 | <4 | 4 | 6 | <20 * | <10 * | Dow |
| RK-211+50-NE710 | 10/21/2006 | 0.0-0.2 | upland | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, many very fine roots | A2 | ML | 34.9 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Dow |
| RK-211+50-NE710 | 10/21/2006 | 0.2-1.5 | upland | 7.5YR 5/4 brown and 2.5Y 5/3 light olive brown silty clay loam, few 10YR 4/6 dark yellowish brown and 7.5YR 5/8 strong brown mottle, moist, massive, moist, firm, very plastic, Grading to silty clay. Horizon divided for analysis. | C1 | CL | 17.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RK-211+50-NE710 | 10/21/2006 | 1.5-2.7 | upland | 7.5YR 5/4 brown and 2.5Y 5/3 light olive brown silty clay loam, few 10YR 4/6 dark yellowish brown and 7.5YR 5/8 strong brown mottle, moist, massive, moist, firm, very plastic, Grading to silty clay. Horizon divided for analysis. | C1 | CL | 19.4 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RK-211+50-NE710 | 10/21/2006 | 2.7-3.3 | upland | 2.5Y 5/1 gray silty clay loam, few 10YR 4/4 dark yellowish brown mottle, moist, massive, moist, firm, moderately plastic, Redox features occur only along a single vertical fracture plane. | Cg2 | CL | 19.7 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RK-211+50-SW55 | 12/12/2006 | 0.0-1.8 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | 3A4 | SM | 20.6 | 39 | 16000 | 4900 | 4400 | 3900 | 29000 | 3800 | Alta |
| RK-211+50-SW55 | 12/12/2006 | 0.0-1.8 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | 3A4 | SM | 21.3 | 38 | 15000 | 4900 | 5100 | 3900 | 29000 | 4000 | Alta |
| RK-211+50-SW55 | 12/12/2006 | 1.8-2.7 | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic | AC | SP | 13.3 | 6 | 24000 | 9300 | 7500 | 6900 | 48000 | 6200 | Alta |
| RK-211+50-SW55 | 12/12/2006 | 2.7-4.1 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 10.8 | <4 | 6900 | 3100 | 2500 | 2300 | 15000 | 1900 | Alta |
| RK-211+50-SW55 | 12/12/2006 | 4.1-5.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/1 gray sand, moist, single grain, moist, loose, Non-plastic, some fine sand, layer of loam (10 YR 5/1) from 4.4-4.6' | C2 | SW | 13.8 | <4 | 320 | 120 | 100 | 90 | 630 | 85 | Alta |
| RK-211+50-SW55 | 12/12/2006 | 5.0-6.3 | intermediate terrace | 10YR 4/3 brown coarse sand, 60-90% gravel, moist, structureless, moist, loose, Non-plastic, fine, medium and coarse gravel, subangular and angular, coarse sand matrix | 2C3 | GW | 7 | <4 | 26 | 9 | 8 | 6 | 49* | <10 * | Alta |
| RK-211+50-SW55 | 12/12/2006 | 6.3-8.0 | intermediate terrace | 10YR 5/3 brown clay, <15% gravel, moist, structureless, moist, extremely firm, very plastic, fine medium, and coarse subrounded gravel gravel inbedded in clay matrix | 3C4 | CH | 13.5 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-211+50-SW785 | 12/15/2006 | 0.0-1.3 | upper high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common very fine roots | A | ML/CL | 20 | 14 | 13 | <4 | 8 | 15 | 50* | 21* | Alta |
| RK-211+50-SW785 | 12/15/2006 | 1.3-2.4 | upper high terrace | 2.5Y 4/2 dark grayish brown loam, moist, subangular blocky, moist, friable, moderately plastic, few very fine roots | Bw | ML/CL | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-211+50-SW785 | 12/15/2006 | 2.4-4.0 | upper high terrace | 2.5Y 5/2 grayish brown sandy clay, common 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, layer of 10YR 4/2 loamy sediment from 3.0-3.3' may have been mixed from geoprobe (layer above). Fine gravel inbedded in sandy clay matrix | 2C | CH | 14.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-211+50-SW80 | 12/14/2006 | 2.6-3.8 | high terrace | 10YR 3/4 dark yellowish brown clay loam, moist, subangular blocky, moist, firm, moderately plastic | Bt | CL | 16.5 | <4 | 38 | 12 | 11 | 10 | 71 | 11 | Alta |
| RK-211+50-SW80 | 12/14/2006 | 3.8-4.6 | high terrace | 10YR 4/2 dark grayish brown loamy coarse sand, 15<35% gravel, moist, structureless, moist, loose, Non-plastic, medium subangular and angular gravel | 2C1 | SW | 11.5 | <4 | 210 | 70 | 62 | 53 | 400 | 54 | Alta |
| RK-211+50-SW80 | 12/14/2006 | 4.6-5.7 | high terrace | 10YR 5/6 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis very thin layer of black wood at 5.5' | 3C2 | SP | 5.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-211+50-SW80 | 12/14/2006 | 5.7-6.8 | high terrace | 10YR 5/6 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, horizon divided for sample analysis | 3C2 | SP | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-IC-C | 9/22/2006 | 0.0-0.4 | in-channel | 10YR 4/3 brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, fine and medium sand, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, somewhat well sorted | 1 | SP | 5.5 | <4 | 60 | 20 | 28 | 38 | 150 | 23 | Dow |
| RK-216+50-IC-C | 9/22/2006 | 0.0-0.4 Lab Duplicate | in-channel | 10YR 4/3 brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, fine and medium sand, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, somewhat well sorted | 1 | SP | 5.7 | <4 | 110 | 60 | 50 | 71 | 290 | 41 | Dow |
| RK-216+50-IC-C | 9/22/2006 | 0.0-0.4 Field Duplicate | in-channel | 10YR 4/3 brown sand, wet, single grain, moist, loose, Non-plastic, few fine roots, fine and medium sand, non-cohesive, subrounded grains, few coarse sand, very few shell fragments, somewhat well sorted | 1 | SP | 6.1 | <4 | 32 | 15 | 16 | 34 | 96 | 15 | Dow |
| RK-216+50-IC-C | 9/22/2006 | 0.4-1.2 Field Duplicate | in-channel | 10YR 3/1 very dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, few medium and coarse sand, common shell fragments, poorly sorted | 2 | SW | 16.7 | 6 | 54 | 13 | 15 | 40 | 130 | 22 | Dow |
| RK-216+50-IC-C | 9/22/2006 | 0.4-1.2 | in-channel | 10YR 3/1 very dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, few medium and coarse sand, common shell fragments, poorly sorted | 2 | SW | 12.9 | 6 | 26 | 11 | 13 | 24 | 80 | 17 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-IC-NE | 9/22/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very well sorted | 1 | SP | 3.1 | <4 | 7 | <4 | 4 | 7 | <20 * | <10 * | Dow |
| RK-216+50-IC-NE | 9/22/2006 | 0.5-0.9 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, very few shell fragments, well sorted | 2 | SP | 8 | <4 | 12 | <4 | 7 | 10 | 32* | <10 * | Dow |
| RK-216+50-IC-NE | 9/22/2006 | 0.9-1.7 | in-channel | 10YR 3/1 very dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, very few shell fragments | 3 | SM | 15.6 | <4 | 13 | <4 | <4 | 10 | 24* | <10 * | Alta |
| RK-216+50-IC-SW | 9/22/2006 | 0.0-1.5 Field Duplicate | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive, subrounded grains, very fine and fine roots | 1 | SM | 18.9 | <4 | 8 | 4 | <4 | 4 | <20 * | <10 * | Dow |
| RK-216+50-IC-SW | 9/22/2006 | 0.0-1.5 | in-channel | 10YR 3/1 very dark gray loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, non-cohesive, subrounded grains, very fine and fine roots | 1 | SM | 18.9 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RK-216+50-NE115 | 10/23/2006 | 0.0-0.4 | low terrace | 10YR 2/1 black loam, moist, granular, moist, friable, slightly plastic | A | ML/CL | 28.3 | 61 | 820 | 330 | 350 | 790 | 2300 | 370 | Alta |
| RK-216+50-NE115 | 10/23/2006 | 0.4-1.7 | low terrace | 10YR 3/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 9.4 | <4 | 46 | 29 | 27 | 52 | 150 | 23 | Alta |
| RK-216+50-NE115 | 10/23/2006 | 1.7-2.2 | low terrace | 10YR 6/4 light yellowish brow and 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, loamy fine sand (10YR 4/6) from 3.1-3.4' alternating layers approximately 0.4 ft in thickness of 10YR 6/4 fine sand and 10YR 4/6 fine sand. | C1 | SP | 6.9 | <4 | 15 | 7 | 7 | 17 | 46* | <10 * | Alta |
| RK-216+50-NE115 | 10/23/2006 | 2.2-3.3 | low terrace | 10YR 6/4 light yellowish brow and 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, loamy fine sand (10YR 4/6) from 3.1-3.4' alternating layers approximately 0.4 ft in thickness of 10YR 6/4 fine sand and 10YR 4/6 fine sand. | C1 | SP | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-NE115 | 10/23/2006 | 3.3-4.4 | low terrace | 10YR 6/4 light yellowish brow and 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, loamy fine sand (10YR 4/6) from 3.1-3.4' alternating layers approximately 0.4 ft in thickness of 10YR 6/4 fine sand and 10YR 4/6 fine sand. | C1 | SP | 6.6 | <4 | 6 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RK-216+50-NE115 | 10/23/2006 | 4.4-5.2 | low terrace | 10YR 6/4 light yellowish brow and 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, loamy fine sand (10YR 4/6) from 3.1-3.4' alternating layers approximately 0.4 ft in thickness of 10YR 6/4 fine sand and 10YR 4/6 fine sand. | C1 | SP | 6.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-NE115 | 10/23/2006 | 5.2-5.5 | low terrace | 10YR 5/3 brown loamy fine sand, common 10YR 4/6 dark yellowish brown mottle, moist, structureless, moist, loose, Non-plastic | C2 | SP | 13.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-NE185 | 10/23/2006 | 0.0-0.4 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | A | SM | 24.5 | 32 | 1900 | 940 | 840 | 1300 | 5000 | 700 | Alta |
| RK-216+50-NE185 | 10/23/2006 | 0.4-1.8 | high terrace | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 12.8 | <4 | 610 | 290 | 260 | 350 | 1500 | 200 | Alta |
| RK-216+50-NE185 | 10/23/2006 | 1.8-2.9 | high terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown loamy fine sand, moist, subangular blocky, weak, moist, friable, slightly plastic, grades from fine sand to fine sandy loam | C2 | SM | 11 | <4 | 25 | 12 | 11 | 18 | 66 | 11 | Alta |
| RK-216+50-NE185 | 10/23/2006 | 2.9-3.9 | high terrace | 10YR 6/3 pale brown fine sandy loam, moist, structureless, moist, friable, slightly plastic, thin layer of 7.5YR 4/6 at 3.5', fine sandy loam | C3 | SM | 7.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-NE185 | 10/23/2006 | 3.9-5.5 | high terrace | 10YR 4/2 dark grayish brown fine sandy loam, many 10YR 3/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, friable, slightly plastic, layer of 10YR 5/4, fine sandy loam from 4.9-5.1' | C4 | SM | 9.4 | <4 | 9 | 5 | 4 | 7 | 26* | <10 * | Alta |

NOTES:

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DATA FLAGS:

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Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-NE20 | 10/25/2006 | 0.0-0.7 | natural levee | 2.5Y 6/3 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic, Recent flood deposition. | C1 | SP | 4.2 | <4 | 45 | 14 | 13 | 22 | 95 | 14 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 0.7-1.9 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, thin layers of organic debris throughout | C2 | SP | 8.6 | 17 | 790 | 400 | 350 | 630 | 2200 | 300 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 1.9-3.9 | natural levee | 10YR 4/3 brown and 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots | C3 | SP | 9.4 | 25 | 5000 | 1600 | 1500 | 2400 | 11000 | 1400 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 3.9-5.9 | natural levee | 10YR 6/2 light brownish gray fine sand, dry, single grain, dry, loose, Non-plastic, Very thin layers of organic matter at 4.7 ft, 5.2 ft., 5.7 ft, and 5.8 ft. | C4 | SP | 2.5 | 8 | 42000 | 9500 | 10000 | 6100 | 68000 | 9000 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 5.9-7.0 | natural levee | 10YR 5/3 brown and 10YR 6/3 pale brown fine sandy loam, dry, subangular blocky, weak, dry, slightly hard, slightly plastic, very few very coarse roots, Fine sandy loam is 10YR 5/3 and fine sand is 10YR 6/3. Layers of varying thickness of fine sandy loam and fine sand alternate throughout horizon. Horizon divided for sample analysis. | C5 | SC | 4.3 | 8 | 42000 | 17000 | 15000 | 13000 | 87000 | 11000 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 7.0-8.1 | natural levee | 10YR 5/3 brown and 10YR 6/3 pale brown fine sandy loam, dry, subangular blocky, weak, dry, slightly hard, slightly plastic, very few very coarse roots, Fine sandy loam is 10YR 5/3 and fine sand is 10YR 6/3. Layers of varying thickness of fine sandy loam and fine sand alternate throughout horizon. Horizon divided for sample analysis. | C5 | SC | 2.6 | <4 | 8500 | 2600 | 2500 | 1700 | 15000 | 2000 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 8.1-9.3 | natural levee | 10YR 5/3 brown and 10YR 6/3 pale brown fine sandy loam, dry, subangular blocky, weak, dry, slightly hard, slightly plastic, very few very coarse roots, Fine sandy loam is 10YR 5/3 and fine sand is 10YR 6/3. Layers of varying thickness of fine sandy loam and fine sand alternate throughout horizon. Horizon divided for sample analysis. | C5 | SC | 4.4 | <4 | 1100 | 330 | 320 | 220 | 2000 | 260 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 9.3-10.6 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | C6 | SP | 2.7 | <4 | 270 | 80 | 79 | 45 | 480 | 66 | Alta |
| RK-216+50-NE20 | 10/25/2006 | 10.6-11.0 | natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very thin layers of organic material irregularly throughout | C7 | SP | 9.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-NE35 | 10/25/2006 | 0.0-0.5 | high terrace | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, darker layer of 10YR 3/1 at 0.2' | C1 | SP | 9.4 | <4 | 220 | 87 | 82 | 850 | 1200 | 150 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 0.5-1.5 | high terrace | 10YR 2/1 black and 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, Non-plastic, few medium roots | Ab1 | SP | 19.1 | 42 | 34000 | 15000 | 11000 | 17000 | 77000 | 9700 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 1.5-2.6 | high terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few medium roots, decaying wood fragments at 2.1' | Ab2 | SC | 13.8 | 15 | 42000 | 16000 | 15000 | 13000 | 86000 | 11000 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 2.6-3.8 | high terrace | 10YR 6/3 pale brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few medium roots | C2 | SP | 3.2 | <4 | 490 | 200 | 180 | 170 | 1000 | 140 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 3.8-4.6 | high terrace | 10YR 4/4 dark yellowish brown very fine sand, dry, single grain, dry, loose, Non-plastic | C3 | SP | 2.8 | <4 | 420 | 190 | 170 | 160 | 940 | 130 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 4.6-5.5 | high terrace | 10YR 6/4 light yellowish brow and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, Non-plastic, alternating with fine sandy loam 10YR 4/4 | C4 | SP | 3 | <4 | 31 | 16 | 13 | 16 | 76 | 12 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 5.5-6.6 | high terrace | 10YR 6/4 light yellowish brow and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, Non-plastic, alternating with fine sandy loam 10YR 4/4 | C4 | SP | 2.7 | <4 | 610 | 350 | 260 | 330 | 1600 | 200 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 6.6-7.3 | high terrace | 10YR 6/4 light yellowish brow and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, Non-plastic, alternating with fine sandy loam 10YR 4/4 | C4 | SP | 10.6 | <4 | 280 | 100 | 90 | 87 | 560 | 75 | Alta |
| RK-216+50-NE35 | 10/25/2006 | 7.3-8.8 | high terrace | 10YR 4/4 dark yellowish brown fine sandy loam, wet, structureless, moist, friable, slightly plastic, very few fine roots | C5 | SC | 17.9 | <4 | 14 | 7 | 6 | 6 | 33* | <10* | Alta |
| RK-216+50-NE420 | 10/21/2006 | 0.0-1.1 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 4/4 dark yellowish brown mottle, wet, structureless, moist, firm, moderately plastic, many very fine roots, many organic matter near surface | C1 | CL | 39.5 | 20 | 1800 | 910 | 920 | 1200 | 4800 | 680 | Dow |
| RK-216+50-NE420 | 10/21/2006 | 1.1-2.2 | wetland | 10YR 4/2 dark grayish brown silty clay loam, few 10YR 4/4 dark yellowish brown mottle, wet, massive, moist, firm, moderately plastic | Cg2 | ML | 30.2 | 13 | 830 | 450 | 430 | 570 | 2300 | 320 | Dow |
| RK-216+50-NE605 | 10/21/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A1 | SM | 21.7 | 18 | 92 | 59 | 73 | 160 | 400 | 73 | Dow |
| RK-216+50-NE605 | 10/21/2006 | 0.2-2.0 | low terrace | 2.5Y 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots, loamy coarse sand layer [2.5Y 5/4] at 0.5' | C1 | SM | 16.8 | 9 | 240 | 140 | 150 | 230 | 770 | 110 | Dow |
| RK-216+50-NE605 | 10/21/2006 | 2.0-3.0 | low terrace | 2.5Y 3/1 very dark gray loam, <15% gravel, moist, subangular blocky, weak, moist, firm, slightly plastic, very few very fine roots, thin layer of angular gravel at 2.9' | Cg2 | ML/CL | 19.9 | <4 | 15 | 9 | 9 | 13 | 46* | <10* | Dow |
| RK-216+50-NE605 | 10/21/2006 | 3.0-4.4 | low terrace | 10YR 5/4 yellowish brown fine sandy loam, wet, structureless, moist, very friable, slightly plastic, contains fine sand | Cg3 | SM | 19.4 | <4 | 11 | 7 | 8 | 11 | 37* | <10* | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-NE70 | 10/25/2006 | 0.0-1.2 | historic natural levee | 10YR 2/1 black and 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, friable, Non-plastic, very few very fine roots | A | SP | 11.3 | 11 | 1600 | 770 | 660 | 810 | 3900 | 520 | Alta |
| RK-216+50-NE70 | 10/25/2006 | 1.2-2.9 | historic natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bw | SP | 5.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-216+50-NE70 | 10/25/2006 | 2.9-4.7 | historic natural levee | 10YR 3/6 dark yellowish brown and 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 7.6 | <4 | 31 | 18 | 14 | 16 | 79 | 12 | Alta |
| RK-216+50-NE70 | 10/25/2006 | 4.7-6.6 | historic natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 4.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-NE70 | 10/25/2006 | 6.6-7.7 | historic natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown very fine sandy loam, moist, structureless, moist, friable, slightly plastic, very fine sandy loam alternating with fine sand (10YR 5/4) throughout horizon. horizon divided by sample analysis | C3 | SC | 6.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-NE70 | 10/25/2006 | 7.7-8.8 | historic natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown very fine sandy loam, moist, structureless, moist, friable, slightly plastic, very fine sandy loam alternating with fine sand (10YR 5/4) throughout horizon. horizon divided by sample analysis | C3 | SC | 9.5 | <4 | 12 | 4 | 4 | 4 | 24* | <10 * | Alta |
| RK-216+50-NE70 | 10/25/2006 | 8.8-9.9 | historic natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown very fine sandy loam, moist, structureless, moist, friable, slightly plastic, very fine sandy loam alternating with fine sand (10YR 5/4) throughout horizon. horizon divided by sample analysis | C3 | SC | 6.8 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-216+50-NE70 | 10/25/2006 | 9.9-11.0 | historic natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown very fine sandy loam, moist, structureless, moist, friable, slightly plastic, very fine sandy loam alternating with fine sand (10YR 5/4) throughout horizon. horizon divided by sample analysis | C3 | SC | 11.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-SW370 | 12/15/2006 | 0.0-0.6 | high terrace | 2.5Y 3/2 very dark grayish br loam, wet, granular, moist, friable, slightly plastic, many very fine roots, wet from perched water and snow melt | A | ML/CL | 26.7 | 6 | 6 | 4 | 5 | 13 | 35* | 11* | Alta |
| RK-216+50-SW370 | 12/15/2006 | 0.6-2.2 | high terrace | 2.5Y 5/3 light olive brown sandy clay loam, common 2.5Y 5/6 light olive brown mottle, moist, structureless, moist, firm, very plastic, few very fine roots, borderline sandy clay | Bt | CL | 16.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-216+50-SW45 | 12/11/2006 | 0.0-1.2 | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots, horizon divided for sample analysis | A2 | SC | 19.1 | 8 | 190 | 140 | 120 | 150 | 600 | 88 | Alta |
| RK-216+50-SW45 | 12/11/2006 | 0.0-1.2 Field Duplicate | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots, horizon divided for sample analysis | A2 | SC | 19.4 | 7 | 300 | 120 | 110 | 130 | 650 | 93 | Alta |
| RK-216+50-SW45 | 12/11/2006 | 1.2-2.3 | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots, horizon divided for sample analysis | A | SC | 15.2 | <4 | 39 | 11 | 11 | 10 | 71 | 11 | Alta |
| RK-216+50-SW45 | 12/11/2006 | 2.3-4.0 | historic natural levee | 2.5Y 5/2 grayish brown sandy clay, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, horizon divided for sample analysis fine and medium subrounded and subangular gravel | C1 | CH | 13.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RK-216+50-SW45 | 12/11/2006 | 4.0-5.1 | historic natural levee | 2.5Y 5/2 grayish brown sandy clay, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, horizon divided for sample analysis fine and medium subrounded and subangular gravel | C1 | CH | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RK-216+50-SW45 | 12/11/2006 | 5.1-6.0 | historic natural levee | 10YR 5/2 grayish brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, very plastic, horizon divided for sample analysis fine and medium subrounded, subangular and angular gravel | C2 | CL | 12.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RK-216+50-SW75 | 12/14/2006 | 1.3-2.5 | high terrace | 2.5Y 5/2 grayish brown sandy clay, common 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, very few very fine roots, fine and medium subrounded to angular gravel, inbedded piece of granite suggests that it is either glacial till or fill material horizon divided for sample analysis | 2C | CH | 16.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-216+50-SW75 | 12/14/2006 | 2.5-3.7 | high terrace | 2.5Y 5/2 grayish brown sandy clay, common 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, very firm, very plastic, very few very fine roots, fine and medium subrounded to angular gravel, inbedded piece of granite suggests that it is either glacial till or fill material horizon divided for sample analysis | 2C | CH | 12.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-NE135 | 10/23/2006 | 0.0-0.3 | wetland | 2.5Y 3/1 very dark gray silt loam, few 10YR 4/6 dark yellowish brown mottle, moist, granular, weak, moist, friable, slightly plastic, common very fine roots | A | ML | 31.2 | 35 | 1300 | 720 | 630 | 1100 | 3700 | 520 | Alta |
| RK-219+50-NE135 | 10/23/2006 | 0.3-2.2 | wetland | 2.5Y 4/1 dark gray silty clay loam, common 10YR 4/6 dark yellowish brown mottle, wet, angular blocky, weak, moist, firm, moderately plastic | Cg | CL | 21 | <4 | 190 | 120 | 83 | 100 | 490 | 66 | Alta |

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|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-219+50-NE30 | 10/23/2006 | 0.0-1.6 | natural levee | 2.5Y 6/3 light yellowish brow and 2.5Y 5/3 light olive brown sand, moist, single grain, moist, loose, Non-plastic, very thin layers of darker sand throughout | C1 | SP | 7.1 | <4 | 90 | 29 | 34 | 51 | 200 | 30 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 1.6-3.3 | natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic, layer of fine sand (10YR 6/3) at 1.9' and 2.9' undecomposed wood fragments at 3.3' | Ab1 | SM | 14.2 | 42 | 970 | 370 | 360 | 900 | 2600 | 380 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 3.3-4.2 | natural levee | 2.5Y 6/3 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic, Small wood fragment at 3.4 ft. | C2 | SP | 1.9 | 6 | 2600 | 630 | 1200 | 2500 | 6900 | 980 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 4.2-5.1 | natural levee | 10YR 4/3 brown loamy fine sand, dry, subangular blocky, weak, dry, soft, Non-plastic, wood fragments at 4.5' | C3 | SM | 5.4 | <4 | 4000 | 1700 | 1400 | 3200 | 10000 | 1300 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 5.1-6.2 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, thin layer of 10YR 4/3, loamy fine sand at 6.0' | C4 | SP | 2.2 | 8 | 47000 | 17000 | 16000 | 11000 | 91000 | 12000 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 6.2-7.2 | natural levee | 10YR 4/3 brown fine sandy loam, dry, subangular blocky, weak, dry, slightly hard, slightly plastic, few thin layers of clean fine sand | C5 | SM | 8.5 | 7 | 35000 | 14000 | 12000 | 11000 | 71000 | 9300 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 7.2-9.2 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, thin layers of 10YR 4/3, fine sandy loam at 7.5', 7.9' and 8.3' | C6 | SP | 3.3 | <4 | 3800 | 1200 | 1200 | 880 | 7100 | 950 | Alta |
| RK-219+50-NE30 | 10/23/2006 | 9.2-10.0 | natural levee | 10YR 5/3 brown and 10YR 2/1 black fine sand, few 10YR 5/6 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, thin irregular organic matter rich laminations throughout (10YR 2/1) | C7 | SP | 15.3 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-219+50-NE30 | 10/23/2006 | 10.0-10.7 | natural levee | 10YR 6/2 light brownish gray and 10YR 5/2 grayish brown fine sand, few 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, mottles restricted to loamy very fine sand from 10.2-10.4' | C8 | SP | 16.4 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-219+50-NE30 | 10/23/2006 | 10.7-11.0 | natural levee | 10YR 4/2 dark grayish brown loamy fine sand, wet, structureless, moist, very friable, Non-plastic, slightly darker near top of horizon due to organic matter | Cg | SM | 21.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-NE485 | 10/21/2006 | 0.0-0.3 | wetland | 10YR 3/1 very dark gray silty clay loam, moist, subangular blocky, weak, moist, firm, moderately plastic, common very fine roots | A | CL | 31.1 | 26 | 1800 | 420 | 580 | 770 | 3500 | 510 | Dow |
| RK-219+50-NE485 | 10/21/2006 | 0.3-2.2 | wetland | 10YR 4/1 dark gray clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, firm, moderately plastic, common very fine roots | Cg | CL | 18.4 | <4 | 8 | 4 | 6 | 13 | 31 * | <10 * | Dow |
| RK-219+50-NE570 | 10/21/2006 | 0.0-0.3 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, firm, moderately plastic, few very fine roots | A | ML/CL | 33.4 | 26 | 100 | 64 | 84 | 240 | 520 | 97 | Dow |
| RK-219+50-NE570 | 10/21/2006 | 0.3-2.2 | low terrace | 10YR 4/2 dark grayish brown sandy clay, common 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic, horizon divided for analysis | Cg | CH | 15.9 | <4 | 8 | 4 | 7 | 18 | 37 * | <10 * | Dow |
| RK-219+50-NE570 | 10/21/2006 | 2.2-3.3 | low terrace | 10YR 4/2 dark grayish brown sandy clay, common 10YR 4/6 dark yellowish brown mottle, <15% gravel, wet, massive, moist, very firm, very plastic, horizon divided for analysis | Cg | CH | 15.4 | <4 | <4 | <5 | <4 | <4 | <21 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--------------------------------|---------------------------|------------|
| | | | | | | | | | | | | | Congener Concentration (ng/kg) | | |
| RK-219+50-NE70 | 10/23/2006 | 0.0-1.1 | historic natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | SM | 18.4 | 13 | 1500 | 760 | 620 | 820 | 3700 | 500 | Alta |
| RK-219+50-NE70 | 10/23/2006 | 1.1-1.5 | historic natural levee | 10YR 3/4 dark yellowish brown and 10YR 3/2 very dark grayish br loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic | AB | SM | 12.3 | <4 | 57 | 26 | 29 | 29 | 140 | 22 | Alta |
| RK-219+50-NE70 | 10/23/2006 | 1.5-2.5 | historic natural levee | 10YR 3/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots | Bs | SP | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-NE70 | 10/23/2006 | 2.5-3.3 | historic natural levee | 10YR 3/4 dark yellowish brown fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few medium roots, horizon divided for sample analysis, few freshwater shells | C1 | SM | 8.9 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RK-219+50-NE70 | 10/23/2006 | 3.3-4.8 | historic natural levee | 10YR 3/4 dark yellowish brown fine sandy loam, moist, angular blocky, moist, friable, slightly plastic, very few medium roots, horizon divided for sample analysis, few freshwater shells | C1 | SM | 6.5 | <4 | 7 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RK-219+50-NE70 | 10/23/2006 | 4.8-5.5 | historic natural levee | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic, alternating layers of light and dark fine sand, darker layers sometimes loamy fine sand horizon divided fot sample analysis | C2 | SP | 4.9 | <4 | <5 LISR | <4 | <4 | <4 | <21 * | <10 * | Alta |
| RK-219+50-NE70 | 10/23/2006 | 5.5-6.6 | historic natural levee | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic, alternating layers of light and dark fine sand, darker layers sometimes loamy fine sand horizon divided fot sample analysis | C2 | SP | 4.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-NE70 | 10/23/2006 | 6.6-7.7 | historic natural levee | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic, alternating layers of light and dark fine sand, darker layers sometimes loamy fine sand horizon divided fot sample analysis | C2 | SP | 4.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-NE70 | 10/23/2006 | 7.7-8.8 | historic natural levee | 10YR 3/4 dark yellowish brown and 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic, alternating layers of light and dark fine sand, darker layers sometimes loamy fine sand horizon divided fot sample analysis | C2 | SP | 5.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-219+50-SW60 | 12/12/2006 | 0.0-0.8 | intermediate terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots | C1 | SP | 9.3 | 9 | 7300 | 2600 | 2700 | 1700 | 14000 | 2000 | Dow |
| RK-219+50-SW60 | 12/12/2006 | 0.8-2.0 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots, horizon divided for sample analysis | C2 | SP | 8.9 | 6 | 280 | 110 | 130 | 150 | 680 | 99 | Dow |
| RK-219+50-SW60 | 12/12/2006 | 2.0-3.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots, horizon divided for sample analysis | C2 | SP | 10.8 | <8 ^{LISR} | 36 | 16 | 17 | 21 | 90 | 17 | Dow |
| RK-219+50-SW60 | 12/12/2006 | 3.2-4.2 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C3 | ML/CL | 15.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-SW60 | 12/12/2006 | 4.2-5.4 | intermediate terrace | 10YR 5/3 brown sandy clay loam, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, sample divided for sample analysis fine subrounded and subangular gravel | C4 | CL | 13.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-219+50-SW60 | 12/12/2006 | 4.2-5.4 Lab Duplicate | intermediate terrace | 10YR 5/3 brown sandy clay loam, many 10YR 5/6 yellowish brown mottle, <15% gravel, moist, structureless, moist, firm, moderately plastic, sample divided for sample analysis fine subrounded and subangular gravel | C4 | CL | 13.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-224+50-NE115 | 10/20/2006 | 0.0-1.6 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML/CL | 20.8 | 12 | 520 | 290 | 280 | 460 | 1600 | 220 | Dow |
| RK-224+50-NE115 | 10/20/2006 | 1.6-3.3 | intermediate terrace | 10YR 3/4 dark yellowish brown clay loam, moist, subangular blocky, weak, moist, firm, very plastic | Bt | CL | 14.7 | <4 | 5 | <4 | <4 | 4 | <20 [*] | <10 [*] | Dow |
| RK-224+50-NE115 | 10/20/2006 | 3.3-5.5 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy clay loam, moist, angular blocky, weak, moist, friable, moderately plastic | C | CL | 10.8 | <4 | 9 | 4 | 4 | 6 | 22 [*] | <10 [*] | Dow |
| RK-224+50-NE160 | 10/20/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, granular, moist, firm, moderately plastic, few very fine roots | A | CL | 32.8 | 25 | 740 | 430 | 430 | 830 | 2500 | 360 | Dow |
| RK-224+50-NE160 | 10/20/2006 | 0.0-0.3 Lab Duplicate | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, granular, moist, firm, moderately plastic, few very fine roots | A | CL | 32.7 | 25 | 830 | 490 | 490 | 910 | 2800 | 400 | Dow |
| RK-224+50-NE160 | 10/20/2006 | 0.3-1.5 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, few 10YR 3/3 dark brown mottle, moist, angular blocky, weak, moist, firm, moderately plastic | Bw | CL | 20.3 | 4 | 540 | 310 | 290 | 380 | 1500 | 210 | Dow |
| RK-224+50-NE160 | 10/20/2006 | 1.5-3.3 | low terrace | 10YR 4/1 dark gray and 10YR 6/1 gray sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, moderately plastic, horizon divided for analysis | Cg | CL | 19.7 | <4 | 8 | <4 | 4 | 6 | <20 [*] | <10 [*] | Dow |
| RK-224+50-NE160 | 10/20/2006 | 3.3-4.4 | low terrace | 10YR 4/1 dark gray and 10YR 6/1 gray sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, moderately plastic, horizon divided for analysis | Cg | CL | 20.4 | <4 | 11 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-224+50-NE20 | 10/20/2006 | 0.0-1.1 | floodplain | 10YR 5/4 yellowish brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, alternating layers of fine sand [10YR 5/4] and fine sandy loam [10YR 4/2] soil not stable enough for A horizon development thin layer of decaying wood at 1.0' | C1 | SP | 17.5 | <4 | 61 | 36 | 29 | 57 | 190 | 26 | Dow |
| RK-224+50-NE20 | 10/20/2006 | 1.1-1.8 | floodplain | 10YR 5/4 yellowish brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, alternating layers of fine sand [10YR 5/4] and fine sandy loam [10YR 4/2] soil not stable enough for A horizon development | C1 | SP | 27.1 | <7 | 380 | 140 | 160 | 140 | 820 | 120 | Dow |
| RK-224+50-NE20 | 10/20/2006 | 1.8-3.3 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, common 10YR 4/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, wet, subangular blocky, weak, moist, friable, slightly plastic, woody fragments irregular throughout, some layers of fine sand | Cg2 | SM | 28.1 | <4 | 410 | 220 | 190 | 240 | 1100 | 140 | Dow |
| RK-224+50-NE20 | 10/20/2006 | 3.3-4.4 | floodplain | 10YR 4/2 dark grayish brown fine sandy loam, common 10YR 4/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, wet, subangular blocky, weak, moist, friable, slightly plastic, woody fragments irregular throughout, some layers of fine sand | Cg2 | SM | 22.2 | 4 | 940 | 350 | 460 | 550 | 2300 | 330 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 0.0-1.1 | intermediate terrace | 2.5Y 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots | A1 | ML/CL | 21 | 49 | 1500 | 560 | 680 | 1000 | 3800 | 570 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 0.0-1.1 Lab Duplicate | intermediate terrace | 2.5Y 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots | A1 | ML/CL | 21 | 50 | 1900 | 960 | 930 | 1400 | 5300 | 760 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 1.1-2.3 | intermediate terrace | 2.5Y 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots | A2 | ML/CL | 18.6 | 17 | 3500 | 2700 | 3200 | 4900 | 14000 | 2100 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 2.3-3.0 | intermediate terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic | AC | SM | 13.2 | 47 | 75000 | 22000 | 27000 | 22000 | 150000 | 21000 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 3.0-4.1 | intermediate terrace | 10YR 6/3 pale brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, irregular thin layers of loamy fine sand [10YR 4/3] | C1 | SP | 8.8 | 29 | 32000 | 12000 | 13000 | 9700 | 66000 | 9200 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 4.1-5.5 | intermediate terrace | 10YR 6/3 pale brown very fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 5.2 | 14 | 13000 | 3500 | 4600 | 2800 | 24000 | 3400 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 5.5-6.4 | intermediate terrace | 10YR 6/3 pale brown and 10YR 4/3 brown very fine sand, moist, single grain, moist, loose, Non-plastic, few thin layers of fine sandy loam [10 YR 4/3] | C3 | SP | 9.5 | 6 | 3400 | 1200 | 1300 | 880 | 6800 | 940 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 6.4-7.9 | intermediate terrace | 10YR 5/3 brown fine sand, few 10YR 5/8 yellowish brown mottle, wet, single grain, moist, friable, Non-plastic, few very thin layers loamy fine sand | C4 | SP | 17.4 | <4 | 680 | 200 | 230 | 150 | 1300 | 180 | Dow |
| RK-224+50-NE30 | 10/20/2006 | 7.9-8.8 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown fine sandy loam, common 7.5YR 4/6 strong brown and 7.5YR 5/8 strong brown mottle, wet, subangular blocky, weak, moist, friable, slightly plastic, alternating layers of loamy fine sand | C5 | SM | 21.6 | <4 | 15 | 6 | 7 | 5 | 33* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-224+50-NE330 | 10/20/2006 | 0.0-0.9 | wetland | 10YR 3/1 very dark gray , wet, many fine roots, organic surface layer of wetland | Oe | PT | 51.1 | 40 | 2900 | 1500 | 1500 | 2000 | 8000 | 1100 | Dow |
| RK-224+50-NE330 | 10/20/2006 | 0.9-2.2 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, firm, very plastic | Cg | CL | 27.5 | 6 | 650 | 270 | 270 | 260 | 1400 | 200 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-224+50-NE35 | 10/20/2006 | 0.0-0.2 | natural levee | 10YR 2/1 black fine sandy loam, moist, granular, weak, moist, very friable, slightly plastic, very few very fine roots | A1 | SM | 23.7 | 4 | 1000 | 320 | 450 | 380 | 2200 | 310 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 0.2-1.1 | natural levee | 10YR 4/2 dark grayish brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for analysis. | C1 | SP | 10.3 | 18 | 410 | 200 | 240 | 430 | 1300 | 200 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 1.1-2.5 | natural levee | 10YR 4/2 dark grayish brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for analysis. Thin layer of 10YR 6/3 fine sand at 1.6 ft. | C1 | SP | 10.6 | 32 | 3000 | 1600 | 1700 | 2500 | 8700 | 1200 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 2.5-3.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 3.4 | 10 | 2400 | 1200 | 2200 | 3100 | 9000 | 1400 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 3.5-4.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 3.2 | 5 | 1100 | 400 | 430 | 890 | 2800 | 380 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 4.5-5.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 2.9 | 11 | 11000 | 7600 | 5900 | 6700 | 31000 | 4200 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 5.5-6.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 4.5 | 10 | 4800 | 1800 | 1800 | 1900 | 10000 | 1400 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 6.5-7.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 3.4 | 9 | 5600 | 2000 | 2200 | 2100 | 12000 | 1700 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 7.5-8.5 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 2 | 77 | 120000 | 26000 | 29000 | 22000 | 190000 | 26000 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 8.5-9.3 | natural levee | 10YR 6/3 pale brown and 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Thick horizon of fine sand with thin (usually less than 0.1ft) layers of very fine sand and loamy very fine sand (10YR 4/4) interspersed throughout horizon (about a dozen total). Horizon divided for analysis. | C2 | SP | 9.2 | 37 | 64000 | 20000 | 26000 | 21000 | 130000 | 19000 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-224+50-NE35 | 10/20/2006 | 9.3-10.6 Lab Duplicate | natural levee | 2.5Y 5/3 light olive brown fine sand, few 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Thin layer of organic material at 9.6 ft. Wet below 9.9 ft, moist above. | C2 | SP | 28.9 | 46 | 76000 | 23000 | 34000 | 18000 | 150000 | 22000 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 9.3-10.6 | natural levee | 2.5Y 5/3 light olive brown fine sand, few 10YR 4/6 dark yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Thin layer of organic material at 9.6 ft. Wet below 9.9 ft, moist above. | C2 | SP | 13.1 | 47 | 58000 | 17000 | 27000 | 16000 | 120000 | 18000 | Dow |
| RK-224+50-NE35 | 10/20/2006 | 10.6-11.0 | natural levee | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, Thin concentration of organic material and sand with more fines at 10.9 ft. | Cg3 | SP | 19.6 | 79 | 67000 | 15000 | 23000 | 14000 | 120000 | 17000 | Dow |
| RK-224+50-NE85 | 10/20/2006 | 0.0-0.6 | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moist, very friable, slightly plastic | A1 | SM | 17.9 | 11 | 800 | 390 | 420 | 560 | 2200 | 310 | Dow |
| RK-224+50-NE85 | 10/20/2006 | 0.6-2.3 | historic natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic | A2 | SM | 12.9 | <4 | 190 | 110 | 100 | 140 | 530 | 74 | Dow |
| RK-224+50-NE85 | 10/20/2006 | 2.3-3.0 | historic natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic | Bw | SP | 10.5 | <4 | 5 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RK-224+50-NE85 | 10/20/2006 | 3.0-3.5 | historic natural levee | 10YR 3/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | BC | SP | 4.9 | <4 | 21 | 13 | 12 | 24 | 70 | 12 | Dow |
| RK-224+50-NE85 | 10/20/2006 | 3.5-4.4 | historic natural levee | 10YR 4/6 dark yellowish brown and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C | SP | 4.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RK-224+50-NE85 | 10/20/2006 | 4.4-5.5 | historic natural levee | 10YR 4/6 dark yellowish brown and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, shell fragments at 4.9' | C | SP | 7 | <4 | 6 | 4 | 4 | 5 | <20 * | <10 * | Dow |
| RK-224+50-NE85 | 10/20/2006 | 5.5-6.6 | historic natural levee | 10YR 4/6 dark yellowish brown and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C | SP | 2.8 | <4 | 10 | <4 | <4 | <6 ^{LISR} | <22 * | <10 * | Dow |
| RK-224+50-NE85 | 10/20/2006 | 6.6-7.7 | historic natural levee | 10YR 4/6 dark yellowish brown and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C | SP | 7.9 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-224+50-SW45 | 12/11/2006 | 0.0-1.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 19.6 | 71 | 2200 | 780 | 830 | 1400 | 5300 | 770 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 1.2-3.0 Lab Duplicate | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots | AC | SP | 12.9 | 6 | 7900 | 3000 | 2500 | 3000 | 16000 | 2100 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 1.2-3.0 | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots | AC | SP | 12.9 | 5 | 5000 | 2500 | 1900 | 2700 | 12000 | 1500 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 3.0-4.4 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/4 yellowish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, very few very fine roots, interbedded fine sandy loam (10YR 4/2) and fine sand (10YR 5/4), fine sand is single grain, loose, nonplastic | C1 | SM | 13.3 | 7 | 31000 | 12000 | 9700 | 8700 | 61000 | 7900 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 4.4-5.7 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, interbedded fine sandy loam (10YR 4/4) and fine sand (10YR 5/4), fine sand is single grain, loose, non-plastic | C2 | SM | 14.2 | <4 | 83 | 31 | 27 | 24 | 170 | 24 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 5.7-7.4 | intermediate terrace | 10YR 5/3 brown loamy fine sand, few 10YR 5/4 yellowish brown mottle, moist, structureless, moist, very friable, Non-plastic, interbedded fine sandy loam and loamy fine sand, fine sandy loam more prevalent near bottom of horizon | C3 | SM | 16.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-224+50-SW45 | 12/11/2006 | 7.4-8.0 | intermediate terrace | 10YR 5/4 yellowish brown fine sandy loam, moist, structureless, moist, friable, slightly plastic | C4 | SM | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-224+50-SW90 | 12/14/2006 | 3.1-4.2 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 3/1 very dark gray loam, moist, subangular blocky, moist, friable, moderately plastic, common very fine roots, horizon divided for sample analysis fine sandy loam 2.0-2.3', darker layer due to organic matter from 2.5-2.7' (10YR 3/1) | C1 | ML/CL | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-224+50-SW90 | 12/14/2006 | 4.2-6.0 | high terrace | 10YR 4/4 dark yellowish brown sandy clay, <15% gravel, moist, massive, moist, extremely firm, very plastic, coarse sand and fine gravel inbedded in sandy clay matrix (glacial till) | 2C2 | CH | 10.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RK-225+00-T-SW75 | 11/30/2006 | 0.0-0.5 | tributary | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | SM | 31.8 | 55 | 610 | 250 | 260 | 390 | 1600 | 270 | Dow |
| RK-225+00-T-SW75 | 11/30/2006 | 0.5-1.1 | tributary | 10YR 4/2 dark grayish brown sandy clay loam, wet, granular, moist, firm, moderately plastic | AC | ML/CL | 19.2 | 13 | 120 | 53 | 63 | 140 | 390 | 66 | Dow |
| RK-225+00-T-SW75 | 11/30/2006 | 1.1-2.2 | tributary | 10YR 5/4 yellowish brown sandy clay loam, few 10YR 5/6 yellowish brown mottle, <15% gravel, wet, structureless, moist, firm, moderately plastic, More clay than AC horizon. | C | CL | 14.9 | <4 | 10 | <4 | <4 | <13 ^{LISR} | <29 [*] | <10 [*] | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-232+00-IC-C | 9/23/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded grains, very well sorted | 1 | SP | 2.9 | <4 | 6 | <4 | <4 | 7 | <20 * | <10 * | Dow |
| RK-232+00-IC-C | 9/23/2006 | 0.5-1.2 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded grains, very few coarse sand, fine gravel, somewhat well sorted | 2 | SP | 2.9 | <4 | 14 | 5 | 8 | 9 | 36* | <10 * | Dow |
| RK-232+00-IC-C | 9/23/2006 | 1.2-1.7 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, non-cohesive, subrounded grains, very few shell fragments, fine gravel, somewhat well sorted | 3 | SP | 14 | <4 | 32 | 13 | 18 | 61 | 120 | 19 | Dow |
| RK-232+00-IC-C | 9/23/2006 | 1.7-2.0 | in-channel | 10YR 3/2 very dark grayish br sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, non-cohesive, subrounded grains, root/black material | 4 | SM | 19.4 | 5 | 52 | 20 | 29 | 78 | 180 | 30 | Dow |
| RK-232+00-IC-C | 9/23/2006 | 2.0-2.2 | in-channel | 10YR 3/1 very dark gray very fine sandy loam, wet, subangular blocky, moist, friable, slightly plastic, few fine roots, cohesive, very few coarse roots | 5 | SM | 24 | 37 | 1500 | 560 | 630 | 800 | 3500 | 520 | Dow |
| RK-232+00-IC-C | 9/23/2006 | 2.2-2.4 | in-channel | 10YR 4/3 brown loamy fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, common coarse sand, fine gravel, very poorly sorted | 6 | SW | 15.6 | <4 | 63 | 61 | 29 | 31 | 160 | 23 | Dow |
| RK-232+00-IC-NE | 9/23/2006 | 0.0-1.0 | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very well sorted | 1 | SP | 8.9 | <4 | 9 | 4 | 5 | 13 | 31* | <10 * | Dow |
| RK-232+00-IC-NE | 9/23/2006 | 0.0-1.0 Field Duplicate | in-channel | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, very well sorted | 1 | SP | 8.4 | <4 | 7 | <4 | <4 | 6 | <20 * | <10 * | Dow |
| RK-232+00-IC-NE | 9/23/2006 | 1.0-2.0 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, very few coarse sand, well sorted | 2 | SP | 17.6 | <4 | 10 | 5 | 7 | 14 | 36* | <10 * | Dow |
| RK-232+00-IC-NE | 9/23/2006 | 1.0-2.0 Field Duplicate | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium sand, very few coarse sand, well sorted | 2 | SP | 16.4 | <4 | 18 | 7 | 8 | 13 | 46* | <10 * | Dow |
| RK-232+00-IC-SW | 9/23/2006 | 0.0-0.4 | in-channel | 10YR 3/1 very dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, non-cohesive, subrounded and subangular grains, fine and medium gravel, very few shell fragments, poorly sorted | 1 | SW | 3.7 | <4 | 12 | 5 | 4 | 12 | 32* | <10 * | Dow |
| RK-232+00-IC-SW | 9/23/2006 | 0.4-1.5 | in-channel | 10YR 4/1 dark gray coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, non-cohesive, subrounded and subangular grains, fine and medium gravel, common medium sand, poorly sorted | 2 | SW | 9.4 | <4 | 17 | <4 | 5 | 11 | 33* | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach K

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft.bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-232+00-NE190 | 10/19/2006 | 0.0-0.3 | high terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, granular, moist, firm, moderately plastic, common very fine roots | A | CL | 22.3 | 12 | 610 | 330 | 280 | 420 | 1700 | 230 | Alta |
| RK-232+00-NE190 | 10/19/2006 | 0.3-1.7 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fill sand and gravel. | 2C1 | SW | 11.3 | 12 | 490 | 210 | 180 | 460 | 1400 | 190 | Alta |
| RK-232+00-NE190 | 10/19/2006 | 1.7-2.8 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fill sand and gravel. | 2C1 | SW | 9.6 | 5 | 870 | 390 | 320 | 340 | 1900 | 260 | Alta |
| RK-232+00-NE190 | 10/19/2006 | 2.8-3.1 | high terrace | 10YR 4/1 dark gray sandy clay loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic, Surface of native soil. | 3Ab | CL | 16.7 | 23 | 2700 | 1000 | 950 | 1300 | 5900 | 800 | Alta |
| RK-232+00-NE190 | 10/19/2006 | 3.1-4.4 | high terrace | 10YR 4/2 dark grayish brown clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic, Small wood fragments at top of horizon . | 3C2 | CL | 26.4 | 18 | 1800 | 590 | 470 | 390 | 3300 | 440 | Alta |
| RK-232+00-NE190 | 10/19/2006 | 4.4-5.5 | high terrace | 10YR 4/2 dark grayish brown clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic | 3C2 | CL | 23.3 | <4 | 120 | 36 | 28 | 28 | 210 | 28 | Alta |
| RK-232+00-NE40 | 10/19/2006 | 0.0-0.6 | high terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, granular, moist, firm, moderately plastic, common very fine roots | A | CL | 18.1 | 17 | 1100 | 520 | 440 | 580 | 2600 | 360 | Alta |
| RK-232+00-NE40 | 10/19/2006 | 0.6-2.2 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fill sand and gravel. | 2C | SW | 5.4 | 6 | 710 | 310 | 250 | 330 | 1600 | 220 | Alta |
| RK-232+00-NE40 | 10/19/2006 | 2.2-3.3 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fill sand and gravel. | 2C | SW | 6.1 | 4 | 950 | 480 | 340 | 390 | 2200 | 280 | Alta |
| RK-232+00-NE40 | 10/19/2006 | 3.3-4.4 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Fill sand and gravel. | 2C | SW | 7.7 | 5 | 450 | 190 | 200 | 210 | 1100 | 150 | Alta |

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GeoMorph Site Characterization Data Summary

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| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RK-232+00-SW20 | 12/13/2006 | 2.0-3.0 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few very fine roots, fine and medium subangular gravel, few shell fragments horizon divided for sample analysis | 2C1 | SW | 9.3 | 4 | 380 | 160 | 130 | 180 | 860 | 110 | Alta |
| RK-232+00-SW20 | 12/13/2006 | 3.0-4.0 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few very fine roots, fine and medium subangular gravel, few shell fragments horizon divided for sample analysis | 2C1 | SW | 6.1 | <4 | 330 | 130 | 110 | 140 | 710 | 96 | Alta |
| RK-232+00-SW20 | 12/13/2006 | 4.0-4.4 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few very fine roots, fine and medium subangular gravel, few shell fragments horizon divided for sample analysis | 2C1 | SW | 5.9 | <4 | 250 | 100 | 89 | 110 | 550 | 74 | Alta |
| RK-232+00-SW20 | 12/13/2006 | 4.4-4.8 | high terrace | 10YR 3/2 very dark grayish br loam, few 7.5YR 3/3 dark brown mottle, moist, angular blocky, moist, firm, moderately plastic, few fine roots | 3C2 | CL | 16.3 | 10 | 630 | 310 | 260 | 330 | 1500 | 210 | Alta |
| RK-232+00-SW20 | 12/13/2006 | 4.8-6.7 | high terrace | 10YR 4/4 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few very fine roots, fine and medium subangular gravel, few shell fragments, large white stone at 5.0' 7.5YR 3/3 thin layer at 5.5' | 4C3 | SW | 8.4 | <4 | 210 | 89 | 83 | 100 | 490 | 67 | Alta |
| RK-232+00-SW75 | 12/15/2006 | 1.4-2.4 | intermediate terrace | 10YR 5/4 yellowish brown loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, very few very fine roots | Bt | ML/CL | 19.5 | <4 | 10 | 4 | 4 | 4 | 21* | <10* | Alta |
| RK-232+00-SW75 | 12/15/2006 | 2.4-3.4 | intermediate terrace | 10YR 5/3 brown loam, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic | BC | ML/CL | 22.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-235+50-SW10 | 8/2/2006 | 0.0-0.5 | low terrace | 10YR 3/2 very dark grayish br loamy sand, moist, moist, loose, Non-plastic, common very fine roots | A | -- | 6.6 | 9 | 850 | 420 | 410 | 440 | 2100 | 300 | Dow |
| RL-235+50-SW10 | 8/2/2006 | 0.5-0.7 | low terrace | 10YR 3/3 dark brown sand, dry, dry, loose, Non-plastic, fewroots | A/C | -- | 4.4 | 5 | 1600 | 630 | 740 | 620 | 3600 | 520 | Dow |
| RL-235+50-SW10 | 8/2/2006 | 0.7-1.2 | low terrace | 10YR 4/4 dark yellowish brown sand, dry, dry, loose, Non-plastic, fewroots | C1 | -- | 2.6 | 4 | 1300 | 430 | 450 | 360 | 2500 | 350 | Dow |
| RL-235+50-SW10 | 8/2/2006 | 1.2-3.0 | low terrace | 10YR 4/4 dark yellowish brown , dry, dry, loose, Non-plastic, fewroots, Snail shell at 1.4' ; alluvial sandy loam band at 1.3', 0.05' thickness, 10YR 4/6, subangular gravel, 0.5-1.0 cm, 30-50% volume. Lab sample duplicate taken. | C2 | -- | 4.7 | 4 | 250 | 110 | 130 | 140 | 630 | 92 | Dow |
| RL-235+50-SW10 | 8/2/2006 | 1.2-3.0 Lab Duplicate | low terrace | 10YR 4/4 dark yellowish brown , dry, dry, loose, Non-plastic, fewroots, Snail shell at 1.4' ; alluvial sandy loam band at 1.3', 0.05' thickness, 10YR 4/6, subangular gravel, 0.5-1.0 cm, 30-50% volume. Lab sample duplicate taken. | C2 | -- | 4.7 | 4 | 440 | 150 | 180 | 160 | 940 | 140 | Dow |
| RL-235+50-SW10 | 8/14/2006 | 3.0-3.7 | low terrace | 10YR 3/2 very dark grayish br loamy sand, <15% gravel, dry, dry, loose, Non-plastic, Gravel near top, 0.5-1.0 cm - 10% volume | A/B | -- | 7.1 | 7 | 170 | 59 | 74 | 58 | 370 | 57 | Dow |
| RL-235+50-SW10 | 8/14/2006 | 3.7-5.0 | low terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, moist, very friable, Non-plastic, Horizon: Bt1b Lab sample duplicate taken. | 2 | -- | 9.1 | <4 | 220 | 46 | 63 | 29 | 360 | 52 | Dow |
| RL-235+50-SW10 | 8/14/2006 | 3.7-5.0 Lab Duplicate | low terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, moist, very friable, Non-plastic, Horizon: Bt1b Lab sample duplicate taken. | 2 | -- | 8.8 | <4 | 18 | 8 | 9 | 8 | 43* | <10 * | Dow |
| RL-235+50-SW10 | 8/14/2006 | 5.0-7.0 | low terrace | 10YR 4/6 dark yellowish brown fine sandy loam, moist, moist, very friable, slightly plastic, Horizon: Bt2b | -- | -- | 12.8 | <4 | 6 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RL-235+50-SW10 | 8/14/2006 | 7.0-7.3 | low terrace | 10YR 5/4 yellowish brown sand, moist, moist, loose, Non-plastic, Medium sand | BC | -- | 6.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---------------------------|--|---------------------------|------------|
| RL-235+50-SW130 | 8/4/2006 | 0.0-0.5 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, moist, very friable, Non-plastic, common very fine roots | A | -- | 15.8 | 11 | 2900 | 1300 | 1100 | 1300 | 6600 | 870 | Alta |
| RL-235+50-SW130 | 8/4/2006 | 0.5-1.0 | intermediate terrace | 10YR 4/3 brown loamy sand, moist, moist, very friable, Non-plastic, very few very fine roots | C1 | -- | 11.3 | 70 | 4700 | 1900 | 1600 | 1800 | 10000 | 1400 | Alta |
| RL-235+50-SW130 | 8/4/2006 | 1.0-1.3 | intermediate terrace | 10YR 5/3 brown sand, moist, moist, loose, Non-plastic | 2C2 | -- | 1.4 | <4 | 2400 | 1100 | 880 | 1100 | 5400 | 710 | Alta |
| RL-235+50-SW130 | 8/4/2006 | 1.3-3.0 | intermediate terrace | 10YR 3/3 dark brown and 10YR 5/3 brown sandy loam, moist, moist, very friable, slightly plastic, Sand lense 2.0-2.1' | 3C3 | -- | 12.3 | <4 | 1600 | 730 | 620 | 680 | 3600 | 480 | Alta |
| RL-235+50-SW130 | 8/14/2006 | 3.4-4.3 | intermediate terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, few clay coatings intermittent sand lenses | Bt1 | -- | 12.1 | <4 | 18 | 10 | 10 | 9 | 47* | <10* | Dow |
| RL-235+50-SW130 | 8/14/2006 | 4.3-5.3 | intermediate terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, few clay coatings intermittent sand lenses | Bt1 | -- | 13.2 | <4 | 8 | 4 | 4 | 4 | 20* | <10* | Dow |
| RL-235+50-SW130 | 8/14/2006 | 5.3-6.0 | intermediate terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, few clay coatings intermittent sand lenses | Bt1 | -- | 18.5 | <4 | <4 | <4 | <4 | 4 | <20* | <10* | Dow |
| RL-235+50-SW130 | 8/14/2006 | 6.0-6.9 | intermediate terrace | 10YR 3/3 dark brown clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few roots, black coating on peds intermittent sand lenses | B2 | -- | 25.7 | <4 | 53 | 45 | 33 | 36 | 170 | 29 | Dow |
| RL-235+50-SW130 | 8/14/2006 | 6.9-7.7 | intermediate terrace | 10YR 4/2 dark grayish brown clay, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, very plastic, few gleyed | Bg | CL | 18.8 | <4 | 11 | 6 | 5 | 11 | 33* | <10* | Dow |
| RL-235+50-SW130 | 9/7/2006 | 7.7-8.7 | intermediate terrace | 10YR 5/3 brown clay, common 10YR 5/6 yellowish brown mottle, wet, massive, moist, very firm, moderately plastic, very few fine roots, plant fragments | C | CL | 16.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-235+50-SW130 | 9/7/2006 | 8.7-9.9 | intermediate terrace | 10YR 5/3 brown clay, common 10YR 5/6 yellowish brown mottle, wet, massive, moist, very firm, moderately plastic, very few fine roots, plant fragments | C | CL | 16.7 | <4 | 12 | 4 | <4 | <4 | <20* | <10* | Alta |
| RL-235+50-SW130 | 9/7/2006 | 9.9-10.7 | intermediate terrace | 10YR 5/3 brown clay, common 10YR 5/6 yellowish brown mottle, wet, massive, moist, very firm, moderately plastic, very few fine roots, plant fragments | C | CL | 16.1 | <4 | 41 | 17 | 14 | 14 | 86 | 13 | Alta |
| RL-235+50-SW165 | 8/4/2006 | 0.0-1.2 | high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A | -- | 15.9 | 16 | 3200 | 1200 | 1100 | 1200 | 6700 | 890 | Alta |
| RL-235+50-SW165 | 8/4/2006 | 1.2-2.5 | high terrace | 10YR 3/6 dark yellowish brown sandy loam, moist, granular, moist, very friable, slightly plastic, few roots | B | -- | 14.2 | <4 | 16 | 7 | 7 | <8 ^{LSR} | 30* | <10* | Alta |
| RL-235+50-SW165 | 8/4/2006 | 2.5-2.9 | high terrace | 10YR 4/6 dark yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, moist, granular, moist, firm, slightly plastic, few roots | BC | -- | 11.3 | <4 | 17 | 8 | 6 | 8 | 39* | <10* | Alta |
| RL-235+50-SW165 | 8/4/2006 | 2.9-4.3 | high terrace | 10YR 5/6 yellowish brown sand, few mottle, moist, single grain, moist, loose, Non-plastic | C | -- | 11 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-235+50-SW360 | 8/4/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, moist, very friable, slightly plastic, common very fine roots | A | -- | 15.9 | 8 | 700 | 370 | 290 | 400 | 1800 | 240 | Alta |
| RL-235+50-SW360 | 8/4/2006 | 0.6-1.6 | intermediate terrace | 10YR 5/3 brown sand, dry, dry, loose, Non-plastic | 2E | -- | 3.1 | <4 | 58 | 33 | 23 | 39 | 150 | 22 | Alta |
| RL-235+50-SW360 | 8/4/2006 | 1.6-2.9 | intermediate terrace | 7.5YR 4/6 strong brown loamy sand, common mottle, moist, moist, very friable, slightly plastic, Common faint fine mottles Horizon: 2Bt | -- | -- | 6.5 | <4 | 44 | 20 | 15 | 26 | 110 | 14 | Alta |
| RL-235+50-SW360 | 8/4/2006 | 2.9-3.2 | intermediate terrace | sandy clay loam, common 7.5YR 5/8 strong brown mottle, moist, moist, very firm, very plastic, 5PB 6/1 (gley); common, medium distinct mottles | 3C | -- | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-235+50-SW460 | 8/6/2006 | 0.0-1.4 | low terrace | 10YR 2/2 very dark brown sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A | -- | 12.1 | 17 | 2400 | 1000 | 1000 | 1100 | 5600 | 780 | Dow |
| RL-235+50-SW460 | 8/6/2006 | 1.4-3.1 | low terrace | 10YR 3/2 very dark grayish br sandy loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, Mottles few to common (at depth). | B | -- | 12.2 | <4 | 350 | 200 | 180 | 180 | 900 | 130 | Dow |
| RL-235+50-SW460 | 8/6/2006 | 3.1-4.6 | low terrace | 10YR 4/4 dark yellowish brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, granular, moist, friable, slightly sticky, few fine roots, Horizon: Bt Dark black pockets of graphite/carbon type material (less than 2% by volume). | -- | -- | 11.8 | <4 | 95 | 46 | 44 | 42 | 230 | 33 | Dow |
| RL-235+50-SW460 | 8/6/2006 | 4.6-5.9 Lab Duplicate | low terrace | 10YR 4/6 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Sand and gravel <20% gravel. Rounded gravel <1cm diameter, saturated. Lab sample duplicate collected. | C2 | -- | 10.5 | <4 | 7 | 4 | 4 | <4 | <20 * | <10 * | Dow |
| RL-235+50-SW460 | 8/6/2006 | 4.6-5.9 | low terrace | 10YR 4/6 dark yellowish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, Sand and gravel <20% gravel. Rounded gravel <1cm diameter, saturated. Lab sample duplicate collected. | C2 | -- | 10.6 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-235+50-SW460 | 9/8/2006 | 6.0-7.0 | low terrace | 10YR 4/6 dark yellowish brown, wet, single grain, moist, loose, slightly plastic, Gravelly loamy sand, silty gravel (GM). Rounded to subangular gravel, dia. 1mm to <1cm. | C2 | -- | 11.6 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RL-235+50-SW525 | 8/6/2006 | 0.0-0.6 | high terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | -- | 8.9 | 9 | 23 | 13 | 19 | 32 | 96 | 23 | Dow |
| RL-235+50-SW525 | 8/6/2006 | 0.6-1.1 | high terrace | 10YR 4/3 brown clay, <15% gravel, dry, subangular blocky, dry, hard, moderately plastic, few roots, Horizon: Bt Gravel (<1cm) <2% volume | -- | -- | 6.4 | <4 | 7 | 4 | 4 | 7 | 22* | <10 * | Dow |
| RL-235+50-SW525 | 9/8/2006 | 1.1-2.1 | high terrace | 10YR 4/3 brown clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few roots, Mottles, few, fine, <1% volume, hard pan. Horizon: Bt | -- | CL | 9.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-235+50-SW525 | 9/8/2006 | 2.1-2.9 | high terrace | 10YR 4/3 brown clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few roots, Mottles, few, fine, <1% volume, hard pan. Horizon: Bt | -- | CL | 5.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-235+50-SW615 | 8/6/2006 | 0.0-0.6 | upper high terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | -- | 7 | 8 | 9 | 5 | 8 | 12 | 42* | 14* | Dow |
| RL-235+50-SW615 | 8/6/2006 | 0.6-1.5 | upper high terrace | 10YR 4/3 brown clay, <15% gravel, dry, subangular blocky, dry, hard, moderately plastic, fewroots, Gravel <1cm, <2% volume | B | -- | 6.1 | 8 | 5 | <4 | 5 | 8 | 27* | 14* | Dow |
| RL-235+50-SW615 | 9/8/2006 | 1.5-2.3 | upper high terrace | 10YR 4/3 brown clay loam, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, subangular blocky, moist, very firm, moderately plastic, fewroots, Mottles, few, fine. Gravel from <1mm to >1cm diam., ~10-15% volume, hard pan Gravelly clay loam, inorganic clay (CL). | B | CL | 9.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-235+50-SW615 | 9/8/2006 | 2.3-3.3 | upper high terrace | 10YR 4/3 brown clay loam, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, subangular blocky, moist, very firm, moderately plastic, fewroots, Mottles, few, fine. Gravel from <1mm to >1cm diam., ~10-15% volume, hard pan Gravelly clay loam, inorganic clay (CL). | B | CL | 7.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-235+50-SW70 | 8/2/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br sand, dry, dry, loose, Non-plastic, common very fine roots | A | -- | 2.4 | 18 | 3000 | 1200 | 1200 | 1000 | 6300 | 890 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 0.3-1.4 | intermediate terrace | 10YR 4/3 brown sand, dry, dry, loose, Non-plastic, fewroots | C1 | -- | 1.1 | 8 | 1700 | 1000 | 990 | 1200 | 4900 | 690 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 1.4-2.0 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, dry, dry, loose, Non-plastic, fewroots | C2 | -- | 1 | 10 | 9100 | 4000 | 3700 | 3200 | 20000 | 2700 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 2.0-3.1 Lab Duplicate | intermediate terrace | 10YR 3/3 dark brown sand, dry, dry, loose, Non-plastic, few very fine roots, Lab sample duplicate collected. | C3 | -- | 1.4 | 9 | 10000 | 4800 | 4200 | 3600 | 23000 | 3000 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 2.0-3.1 | intermediate terrace | 10YR 3/3 dark brown sand, dry, dry, loose, Non-plastic, few very fine roots, Lab sample duplicate collected. | C3 | -- | 2.2 | 10 | 5600 | 2100 | 2200 | 1800 | 12000 | 1600 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 3.1-4.3 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, dry, dry, loose, Non-plastic, fewroots | 2C1 | -- | 5.1 | <4 | 870 | 420 | 390 | 350 | 2000 | 280 | Dow |
| RL-235+50-SW70 | 8/2/2006 | 4.3-4.7 | intermediate terrace | 10YR 3/4 dark yellowish brown loamy sand, dry, dry, loose, Non-plastic, fewroots | 2C2 | -- | 5.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-235+50-SW70 | 9/7/2006 | 4.7-5.9 | intermediate terrace | 10YR 3/4 dark yellowish brown loamy sand, moist, granular, moist, very friable, moderately plastic, fewroots | C2 | SM | 11.5 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RL-235+50-SW70 | 9/7/2006 | 5.9-6.6 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy sand, moist, granular, moist, very friable, slightly plastic, fewroots, Refusal at 6.6' bgs; 70% recovery in sample tube. | C3 | SM | 10.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-236+00-SW10 | 11/3/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moderate, moist, friable, slightly plastic, many fine roots | A | SM | 22.8 | 10 | 1400 | 820 | 710 | 760 | 3700 | 510 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 0.4-1.6 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, Horizon divided for sample analysis. | C1 | SP | 15.7 | 95 | 3900 | 1700 | 1900 | 2000 | 9600 | 1500 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 1.6-2.6 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 4/3 brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, Horizon divided for sample analysis. | C1 | SP | 13.9 | 21 | 4100 | 2200 | 3100 | 2100 | 11000 | 1800 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 2.6-3.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, Alternating layers of fine sand (10YR 5/3) and very fine sandy loam (10YR 4/3, friable, slightly plastic). Horizon divided for sample analysis. | C2 | SP | 5.8 | 23 | 49000 | 20000 | 18000 | 15000 | 100000 | 14000 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 3.5-4.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, Alternating layers of fine sand (10YR 5/3) and very fine sandy loam (10YR 4/3, friable, slightly plastic). Horizon divided for sample analysis. | C2 | SP | 9.2 | 22 | 21000 | 9500 | 10000 | 7700 | 48000 | 6800 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 4.5-5.3 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Some loamy fine sand. Horizon divided for sample analysis. | C3 | SP | 8.8 | <4 | 160 | 71 | 68 | 52 | 350 | 50 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 5.3-6.4 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Some loamy fine sand. Horizon divided for sample analysis. | C3 | SP | 10.7 | <4 | 600 | 320 | 320 | 240 | 1500 | 210 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 6.4-7.5 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Some loamy fine sand. Horizon divided for sample analysis. | C3 | SP | 15.9 | <4 | 200 | 83 | 82 | 66 | 430 | 61 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 7.5-8.7 | intermediate terrace | 10YR 4/4 dark yellowish brown fine sandy loam, wet, single grain, structureless, moist, friable, slightly plastic | C4 | SM | 18.6 | <4 | 55 | 31 | 26 | 27 | 140 | 21 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 8.7-9.7 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, common 7.5YR 5/6 strong brown mottle, wet, structureless, moist, friable, slightly plastic, Horizon divided for sample analysis. | C5 | SM | 20.8 | <4 | 11 | 6 | 5 | 6 | 27* | <10 * | Dow |
| RL-236+00-SW10 | 11/3/2006 | 9.7-10.7 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, common 7.5YR 5/6 strong brown mottle, wet, structureless, moist, friable, slightly plastic, Horizon divided for sample analysis. | C5 | SM | 22.3 | <4 | 69 | 40 | 33 | 34 | 180 | 26 | Dow |
| RL-236+00-SW10 | 11/3/2006 | 10.7-11.9 | intermediate terrace | 10YR 4/1 dark gray and 10YR 5/1 gray fine sandy loam, few 7.5YR 5/6 strong brown mottle, wet, structureless, moist, friable, slightly plastic, Decaying wood fragment 11.5 - 11.6'. | Cg | SM | 30 | <4 | 6 | 4 | <4 | <4 | <20 * | <10 * | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-236+00-SW70 | 11/3/2006 | 0.0-1.6 | historic natural levee | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | A | SP | 8.4 | 7 | 4000 | 1700 | 2000 | 1500 | 9200 | 1300 | Dow |
| RL-236+00-SW70 | 11/3/2006 | 1.6-2.2 | historic natural levee | 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | AB | SP | 6.7 | <4 | 110 | 37 | 39 | 26 | 210 | 31 | Dow |
| RL-236+00-SW70 | 11/3/2006 | 2.2-3.2 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 6.7 | <4 | 680 | 450 | 340 | 320 | 1800 | 240 | Dow |
| RL-236+00-SW70 | 11/3/2006 | 3.2-3.9 | historic natural levee | 10YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon should be Bhs. | Bh | SP | 9.3 | <4 | 51 | 23 | 23 | 22 | 120 | 18 | Dow |
| RL-236+00-SW70 | 11/3/2006 | 3.9-5.5 | historic natural levee | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon should be Bs. | Bs | SP | 8.4 | <4 | 51 | 24 | 23 | 22 | 120 | 19 | Dow |
| RL-236+00-SW70 | 11/3/2006 | 5.5-6.6 | historic natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C | SP | 6.6 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RL-239+00-IC-C | 10/7/2006 | 0.0-0.4 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, fine gravel, very few shell fragments, somewhat well sorted | 1 | SP | 5.3 | <4 | 22 | 5 | 6 | 6 | 39* | <10 [*] | Dow |
| RL-239+00-IC-C | 10/7/2006 | 0.4-1.3 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium roots, noncohesive, subrounded grains, fine and medium gravel, very few angular glossy black coarse sand, medium and coarse roots/black material, layer of black material at 1.3', poorly sorted | 2 | SW | 15.7 | <4 | 490 | 260 | 250 | 250 | 1300 | 170 | Dow |
| RL-239+00-IC-NE | 10/7/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, very few coarse roots, noncohesive, subrounded grains few medium and coarse sand blackmaterial with roots well sorted | 1 | SP | 4.3 | <4 | 12 | <4 | 4 | 5 | 21* | <10 [*] | Dow |
| RL-239+00-IC-NE | 10/7/2006 | 0.4-1.4 | in-channel | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains few coarse sand very few shell fragments somewhat well sorted | 2 | SP | 13.5 | <4 | 14 | 10 | 9 | 44 | 77 | 12 | Dow |
| RL-239+00-IC-SW | 10/8/2006 | 0.0-0.7 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium roots, noncohesive, subrounded grains, common coarse sand, fine gravel, few shell fragments, medium and coarse roots/black material, very few angular glossy black coarse sand layer at 0.7', somewhat well sorted | 1 | SP | 6.3 | <4 | 130 | 27 | 220 | 700 | 1100 | 170 | Alta |
| RL-239+00-IC-SW | 10/8/2006 | 0.7-1.1 | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, very few fine roots, noncohesive, subrounded grains, common coarse sand, fine gravel, roots/black material, few shell fragments, very few angular glossy black coarse sand | 2 | SM | 15.2 | <4 | 170 | 38 | 40 | 28 | 270 | 37 | Alta |
| RL-239+00-IC-SW | 10/8/2006 | 1.1-1.5 | in-channel | 10YR 4/1 dark gray coarse sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, coarse sand and gravel, noncohesive, subrounded grains, few shell fragments, few angular glossy black coarse sand, somewhat poorly sorted | 3 | SW | 8.3 | <4 | 100 | 27 | 32 | 36 | 200 | 30 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+00-SW10 | 8/6/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, moist, loose, slightly plastic, few very fine roots | A | -- | 14.4 | 13 | 2000 | 1300 | 970 | 1000 | 5300 | 710 | Dow |
| RL-239+00-SW10 | 8/6/2006 | 0.4-2.4 | intermediate terrace | 10YR 4/3 brown loamy sand, moist, moist, loose, Non-plastic, few coarse roots | C1 | -- | 6.8 | 32 | 1500 | 750 | 730 | 1200 | 4200 | 600 | Dow |
| RL-239+00-SW10 | 8/14/2006 | 2.4-3.4 | intermediate terrace | 10YR 5/3 brown sand, moist, moist, loose, Non-plastic, few fine roots | C2 | -- | 3.5 | 27 | 22000 | 6300 | 7400 | 5800 | 41000 | 5700 | Dow |
| RL-239+00-SW10 | 8/14/2006 | 3.4-4.1 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, loose, Non-plastic, few fine roots | 2Ab | -- | 8.1 | 13 | 19000 | 8400 | 7900 | 7600 | 43000 | 5800 | Dow |
| RL-239+00-SW10 | 8/14/2006 | 4.1-5.1 | intermediate terrace | 10YR 5/4 yellowish brown loamy fine sand, moist, loose, Non-plastic, Horizon: 2ABb | -- | -- | 7.5 | <4 | 1600 | 540 | 580 | 380 | 3100 | 450 | Dow |
| RL-239+00-SW10 | 8/14/2006 | 5.1-6.2 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy fine sand, moist, loose, Non-plastic, Horizon: 2Bsb1 | -- | -- | 9 | <4 | 1800 | 680 | 650 | 430 | 3500 | 480 | Dow |
| RL-239+00-SW10 | 8/14/2006 | 6.2-7.5 | intermediate terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, loose, Non-plastic, Horizon: 2Bsb2 | -- | -- | 11.7 | <4 | 16 | 8 | 9 | 8 | 42* | <10* | Dow |
| RL-239+00-SW10 | 8/19/2006 | 7.5-8.4 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy fine sand, moist, loose, Non-plastic, Horizon: 2Bsb3 | -- | SM | 11.8 | <4 | 200 | 73 | 75 | 69 | 420 | 59 | Dow |
| RL-239+00-SW10 | 8/19/2006 | 7.5-8.4 Lab Duplicate | intermediate terrace | 10YR 4/4 dark yellowish brown loamy fine sand, moist, loose, Non-plastic, Horizon: 2Bsb3 | -- | SM | 10.5 | <4 | 230 | 82 | 84 | 71 | 470 | 65 | Dow |
| RL-239+00-SW10 | 8/19/2006 | 8.4-10.2 | intermediate terrace | 10YR 5/1 gray fine sandy loam, common 7.5YR 5/6 strong brown mottle, moist, subangular blocky, moist, very friable, slightly plastic, Gray matrix with common coarse prominent mottles | 2C3 | -- | 17.5 | <4 | 20 | 14 | 12 | 30 | 76 | 12 | Dow |
| RL-239+00-SW10 | 9/8/2006 | 10.2-11.7 | intermediate terrace | 10YR 5/1 gray sandy loam, few 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, very friable, slightly plastic, few roots, Mottles, few, fine, white shells (fresh water), <2mm diam, <1% volume. | 2C4 | SM | 18.5 | <4 | 6 | <4 | <4 | <4 | <20* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+00-SW110 | 8/6/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, moist, friable, moderately plastic, common very fine roots | Ap | -- | 17.9 | 12 | 1500 | 680 | 660 | 680 | 3500 | 490 | Dow |
| RL-239+00-SW110 | 8/6/2006 | 0.6-1.3 | intermediate terrace | 10YR 3/6 dark yellowish brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, very few very fine roots | Bs | -- | 10.6 | <4 | 55 | 26 | 27 | 28 | 140 | 21 | Dow |
| RL-239+00-SW110 | 8/6/2006 | 1.3-2.3 | intermediate terrace | 10YR 6/4 light yellowish brow sand, moist, moist, loose, Non-plastic | 2C1 | -- | 0.9 | <4 | 9 | 5 | 5 | 5 | 23* | <10* | Dow |
| RL-239+00-SW110 | 8/6/2006 | 2.3-3.5 | intermediate terrace | 10YR 4/4 dark yellowish brown and 10YR 6/4 light yellowish brow sandy clay loam, moist, moist, very friable, slightly plastic, Sandy clay loam with lenses of sand (10YR 6/4). | 3C2 | -- | 12.7 | <4 | <8 LISR | <8 | <8 | <14 | <42 | <10 | Dow |
| RL-239+00-SW110 | 9/8/2006 | 3.5-4.6 | intermediate terrace | 10YR 3/3 dark brown sandy loam, few 10YR 5/4 yellowish brown mottle, moist, granular, moist, very friable, moderately plastic, few roots, Mottles, few, fine. Sandy loam. | 3C2 | SM | 15.4 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Alta |
| RL-239+00-SW110 | 9/8/2006 | 4.6-6.1 | intermediate terrace | 10YR 4/3 brown loamy sand, few 10YR 5/4 yellowish brown mottle, moist, single grain, moist, very friable, slightly plastic, few roots, Silty sand (SM), pockets/layers of poorly graded sand (<2mm thick). Mottles, few, fine. White shells, <2mm diameter, <1% volume. | 3C3 | SM | 12.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW150 | 8/6/2006 | 0.0-0.5 | low terrace | 10YR 2/1 black sandy loam, moist, moist, very friable, slightly plastic, common fine roots | A | -- | 25.9 | 12 | 770 | 330 | 350 | 410 | 1900 | 270 | Dow |
| RL-239+00-SW150 | 8/6/2006 | 0.5-0.7 | low terrace | 10YR 3/4 dark yellowish brown sandy loam, moist, moist, very friable, slightly plastic, few fine roots | AB | -- | 16.2 | 4 | 97 | 47 | 53 | 58 | 260 | 41 | Dow |
| RL-239+00-SW150 | 8/6/2006 | 0.7-2.8 | low terrace | 10YR 4/6 dark yellowish brown sandy loam, moist, moist, very friable, slightly plastic, very few very fine roots | Bs | -- | 13.2 | <4 | 23 | 10 | 11 | 13 | 57 | <10* | Dow |
| RL-239+00-SW150 | 8/6/2006 | 2.8-3.4 | low terrace | 10YR 5/4 yellowish brown loamy sand, few 5YR 4/6 yellowish red mottle, moist, loose, Non-plastic, Few medium prominent mottles. Common freshwater snail and small clam shells. | C | -- | 13.5 | <4 | 17 | 10 | 9 | 15 | 50* | <10* | Dow |
| RL-239+00-SW150 | 9/8/2006 | 3.4-4.6 | low terrace | 10YR 5/3 brown sandy loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, few roots, Sandy loam, moist to 4.3' bgs, then wet. Mottles, few, fine. White shells (freshwater), ~2mm diameter, <1% by volume. | 2C | SM | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW150 | 9/8/2006 | 4.6-5.6 | low terrace | 10YR 5/3 brown sandy loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, few roots, Sandy loam, moist to 4.3' bgs, then wet. Mottles, few, fine. White shells (freshwater), ~2mm diameter, <1% by volume. | 2C | SM | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+00-SW170 | 8/6/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/1 very dark gray sandy loam, moist, moist, friable, moderately plastic, few fine roots | A | -- | 22.8 | 34 | 2300 | 890 | 1100 | 1400 | 5700 | 810 | Dow |
| RL-239+00-SW170 | 8/6/2006 | 0.3-0.6 | intermediate terrace | 10YR 3/3 dark brown sandy loam, moist, moist, friable, moderately plastic, few fine roots | AB | -- | 16.8 | 17 | 2200 | 1100 | 1000 | 1200 | 5400 | 810 | Dow |
| RL-239+00-SW170 | 8/6/2006 | 0.6-1.4 | intermediate terrace | 10YR 3/4 dark yellowish brown sandy loam, moist, moist, very friable, slightly plastic | Bs1 | -- | 12.9 | <4 | 510 | 290 | 270 | 260 | 1300 | 200 | Dow |
| RL-239+00-SW170 | 8/6/2006 | 1.4-2.7 | intermediate terrace | 10YR 4/3 brown sandy loam, few mottle, moist, moist, very friable, slightly plastic, Few, faint, fine, mottles. Horizon: Bsh | Bs2 | -- | 12.8 | <4 | 5 | <4 | <4 | <10 ^{LSR} | <26 [*] | <10 [*] | Dow |
| RL-239+00-SW170 | 8/6/2006 | 2.7-3.9 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, few mottle, moist, moist, very friable, slightly plastic, Few, faint, fine, mottles. Horizon: Bsh | -- | -- | 15.1 | 5 | 130 | 59 | 63 | 78 | 330 | 51 | Dow |
| RL-239+00-SW170 | 8/6/2006 | 3.9-4.4 | intermediate terrace | 10YR 5/3 brown sand, moist, moist, loose, Non-plastic | 2C | -- | 11 | <4 | 50 | 25 | 21 | 36 | 130 | 19 | Dow |
| RL-239+00-SW170 | 9/8/2006 | 4.4-5.6 | intermediate terrace | 10YR 4/6 dark yellowish brown sandy loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, Mottles, few, fine | 2C1 | SM | 13.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW170 | 9/8/2006 | 5.6-6.7 | intermediate terrace | 10YR 5/2 grayish brown loam, common 10YR 5/8 yellowish brown mottle, wet, granular, moist, very friable, moderately plastic, Mottles, common, medium. Saturated at ~6.0' bgs. Black deposits (manganese?), <2% area, fine to medium, smears easily. Land use=woodland | 2C2 | ML/CL | 17 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW220 | 8/6/2006 | 0-0.3 | low terrace | 10YR 3/1 very dark gray loam, moist, moist, friable, moderately plastic, few fine roots | A | -- | 33.6 | 54 | 3300 | 1700 | 1700 | 2000 | 8800 | 1300 | Dow |
| RL-239+00-SW220 | 8/6/2006 | 0.3-0.8 | low terrace | 10YR 3/2 very dark grayish br loam, few mottle, moist, moist, friable, moderately plastic, few fine roots, Few, fine, faint, mottles | AC | -- | 20.7 | 11 | 4300 | 2100 | 2100 | 2300 | 11000 | 1500 | Dow |
| RL-239+00-SW220 | 8/6/2006 | 0.8-1.4 | low terrace | 10YR 4/2 dark grayish brown clay loam, common mottle, firm, moderately plastic, 10YR 4/2 matrix. Common medium distinct mottles | C1 | -- | 22.5 | <4 | 960 | 520 | 460 | 410 | 2300 | 320 | Dow |
| RL-239+00-SW220 | 8/19/2006 | 1.4-2.4 | low terrace | 10YR 4/2 dark grayish brown clay loam, common mottle, moist, massive, moist, moderately plastic, 10YR 4/2 matrix. Common medium distinct mottles. | C2 | -- | 22 | <4 | 83 | 41 | 40 | 39 | 200 | 30 | Dow |
| RL-239+00-SW220 | 8/19/2006 | 2.4-3.5 | low terrace | 10YR 4/2 dark grayish brown clay loam, common mottle, massive, very firm, very plastic, 10YR 4/2 matrix. Common medium distinct mottles. | C3 | CH | 19.7 | <4 | 13 | 12 | 7 | 10 | 41 [*] | <10 [*] | Dow |
| RL-239+00-SW220 | 9/9/2006 | 3.5-5.0 | low terrace | 10YR 5/1 gray clay, few 10YR 5/8 yellowish brown mottle, moist, massive, moist, firm, moderately plastic, few roots, Mottles, few to common, medium. Black deposit noted (charcoal, manganese? <2mm diameter). | C3 | CL | 20.5 | <4 | 12 | 5 | 5 | 5 | 26 [*] | <10 [*] | Dow |
| RL-239+00-SW220 | 9/9/2006 | 5.0-6.3 | low terrace | 10YR 5/1 gray clay, few 10YR 5/8 yellowish brown mottle, moist, massive, moist, firm, moderately plastic, few roots, Mottles, few to common, medium. Black deposit noted (charcoal, manganese? <2mm diameter). | C3 | CL | 23.2 | <4 | 68 | 29 | 29 | 23 | 150 | 22 | Dow |

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DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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"ML" indicates elevated reporting limit due to matrix interference.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+00-SW335 | 8/7/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, moist, friable, slightly plastic, very few very fine roots | A | -- | 26.4 | 29 | 1200 | 640 | 640 | 870 | 3400 | 490 | Dow |
| RL-239+00-SW335 | 8/7/2006 | 0.3-0.6 | intermediate terrace | 10YR 4/3 brown sandy loam, moist, moist, friable, slightly plastic, very few very fine roots | AE | -- | 18.4 | 17 | 1500 | 770 | 750 | 950 | 3900 | 550 | Dow |
| RL-239+00-SW335 | 8/7/2006 | 0.6-1.5 | intermediate terrace | 10YR 5/4 yellowish brown loamy fine sand, moist, moist, very friable, slightly plastic, Lab sample duplicate collected. | 2E | -- | 9.9 | <4 | 140 | 83 | 76 | 100 | 410 | 57 | Dow |
| RL-239+00-SW335 | 8/7/2006 | 0.6-1.5 Lab Duplicate | intermediate terrace | 10YR 5/4 yellowish brown loamy fine sand, moist, moist, very friable, slightly plastic, Lab sample duplicate collected. | 2E | -- | 10.7 | <4 | 200 | 110 | 100 | 120 | 530 | 75 | Dow |
| RL-239+00-SW335 | 8/7/2006 | 1.5-2.5 | intermediate terrace | 7.5YR 4/6 strong brown sandy clay loam, firm, moderately plastic | Bt | -- | 12.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW335 | 8/7/2006 | 2.5-3.2 | intermediate terrace | 10YR 5/3 brown loamy fine sand, few mottle, friable, slightly plastic, Few, medium, faint, mottles. | C | -- | 13.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW455 | 8/7/2006 | 0.0-0.6 | low terrace | 10YR 3/1 very dark gray loam, moist, moist, friable, moderately plastic, common very fine roots | A | -- | 27.8 | 31 | 470 | 310 | 300 | 440 | 1600 | 240 | Dow |
| RL-239+00-SW455 | 8/7/2006 | 0.6-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, moist, friable, moderately plastic, few very fine roots | AC | -- | 21.3 | <4 | 200 | 110 | 110 | 130 | 560 | 80 | Dow |
| RL-239+00-SW455 | 8/7/2006 | 1.2-3.1 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, firm, moderately plastic, Common, medium, distinct, mottles. | C | -- | 15.8 | <4 | 14 | 8 | 8 | 10 | 40* | <10* | Dow |
| RL-239+00-SW455 | 9/9/2006 | 3.1-3.4 | low terrace | 10YR 5/1 gray clay, common 7.5YR 6/8 reddish yellow mottle, wet, massive, moist, firm, moderately plastic, few fine roots, Mottles, common, medium. | C1 | CL | 22.3 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Dow |
| RL-239+00-SW455 | 9/9/2006 | 3.4-5.2 | low terrace | 10YR 5/2 grayish brown sand, wet, granular, moist, loose, Non-plastic | C2 | SW | 17.6 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RL-239+00-SW560 | 8/8/2006 | 0.0-0.6 | upper high terrace | 10YR 4/2 dark grayish brown loamy sand, moist, granular, moist, very friable, Non-plastic, common very fine roots | A | -- | 6.2 | <4 | 4 | <4 | <4 | 6 | <20* | <10* | Dow |
| RL-239+00-SW560 | 8/8/2006 | 0.6-1.2 | upper high terrace | 2.5YR 5/4 reddish brown loamy sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | E | -- | 8.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW560 | 8/8/2006 | 1.2-2.2 | upper high terrace | 10YR 4/4 dark yellowish brown sandy loam, moist, subangular blocky, moist, firm, moderately plastic | Bt1 | -- | 11.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW560 | 8/8/2006 | 2.2-3.2 | upper high terrace | 7.5YR 4/6 strong brown coarse sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, Fine gravel | 2Bt2 | -- | 7.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW560 | 8/8/2006 | 3.2-4.1 | upper high terrace | 2.5Y 4/4 olive brown, <15% gravel, single grain, loose, Non-plastic, Coarse loamy sand. Fine gravel <2%. | 2C | -- | 4.9 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+00-SW70 | 8/5/2006 | 0.0-0.5 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, moist, loose, slightly plastic, few very fine roots | A | -- | 12 | 14 | 1600 | 860 | 840 | 960 | 4300 | 600 | Dow |
| RL-239+00-SW70 | 8/5/2006 | 0.5-1.0 | high terrace | 10YR 3/3 dark brown loamy sand, moist, moist, loose, slightly plastic | AB | -- | 7.8 | 11 | 2300 | 1000 | 940 | 1000 | 5300 | 730 | Dow |
| RL-239+00-SW70 | 8/5/2006 | 1.0-2.2 | high terrace | 10YR 3/6 dark yellowish brown loamy sand, moist, moist, loose, slightly plastic, Horizon: Bhs | -- | -- | 7.9 | <4 | 85 | 35 | 38 | 41 | 200 | 28 | Dow |
| RL-239+00-SW70 | 8/5/2006 | 2.2-4.3 | high terrace | 7.5YR 4/6 strong brown loamy sand, moist, moist, loose, slightly plastic | Bs | -- | 9.2 | <4 | 16 | 5 | 6 | 5 | 32* | <10* | Dow |
| RL-239+00-SW70 | 8/5/2006 | 4.3-5.0 | high terrace | 10YR 4/6 dark yellowish brown loamy sand, moist, moist, very friable, slightly plastic | C1 | -- | 7.7 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RL-239+00-SW70 | 8/5/2006 | 5.0-5.9 | high terrace | 10YR 3/6 dark yellowish brown sandy clay loam, moist, moist, friable, moderately plastic | 2C2 | -- | 15.9 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Dow |
| RL-239+00-SW70 | 9/8/2006 | 5.9-7.1 | high terrace | 10YR 3/6 dark yellowish brown clay loam, moist, granular, moist, friable, moderately plastic, Few white shells (freshwater), diameter <1mm, <1% volume. | C2 | ML/CL | 18.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW70 | 9/8/2006 | 7.1-8.3 | high terrace | 10YR 3/6 dark yellowish brown clay loam, moist, granular, moist, friable, moderately plastic, Few white shells (freshwater), diameter <1mm, <1% volume. | C2 | ML/CL | 17.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+00-SW905 | 8/8/2006 | 0.0-0.6 Lab Duplicate | upper high terrace | 10YR 4/2 dark grayish brown loamy sand, granular, very friable, slightly plastic, common very fine roots, Lab sample duplicate collected. | 2Ap | -- | 9.9 | 5 | 10 | 5 | 9 | 11 | 40* | 10* | Dow |
| RL-239+00-SW905 | 8/8/2006 | 0.0-0.6 | upper high terrace | 10YR 4/2 dark grayish brown loamy sand, granular, very friable, slightly plastic, common very fine roots, Lab sample duplicate collected. | 2Ap | -- | 10.6 | 5 | 6 | <4 | 7 | 12 | 33* | <10* | Dow |
| RL-239+00-SW905 | 8/8/2006 | 0.6-1.5 Lab Duplicate | upper high terrace | 10YR 4/6 dark yellowish brown sandy loam, common 7.5YR 4/6 strong brown mottle, dry, subangular blocky, dry, slightly hard, slightly plastic, Common, medium, distinct, mottles Lab sample duplicate collected. | 2Bt1 | -- | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW905 | 8/8/2006 | 0.6-1.5 | upper high terrace | 10YR 4/6 dark yellowish brown sandy loam, common 7.5YR 4/6 strong brown mottle, dry, subangular blocky, dry, slightly hard, slightly plastic, Common, medium, distinct, mottles Lab sample duplicate collected. | 2Bt1 | -- | 11.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-239+00-SW905 | 8/8/2006 | 1.5-2.8 | upper high terrace | 10YR 4/4 dark yellowish brown sandy clay loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, friable, moderately plastic, Common, fine and medium distinct mottles. | Bt2 | -- | 10.3 | <4 | <5 | <6 | <4 | <12 | <27 | <10 | Dow |
| RL-239+00-SW905 | 8/8/2006 | 2.8-4.8 | upper high terrace | 2.5Y 5/3 light olive brown sandy clay loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Common medium mottles. Fine and medium gravel | 2C | -- | 9.5 | <4 | <4 | <4 | <4 | <9 | <25 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-239+05-SW10 | 10/17/2006 | 11.7-12.2 | intermediate terrace | 10YR 3/1 very dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few angular glossy black fine sand subrounded grains | 2C3 | SM | 14.2 | 8 | 23000 | 8100 | 7000 | 5700 | 43000 | 5700 | Alta |
| RL-239+05-SW10 | 10/17/2006 | 12.2-13.1 | intermediate terrace | 10YR 5/2 grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few angular glossy black fine sand subrounded grains | 2C4 | SM | 15.1 | <4 | 24 | 8 | 7 | 7 | 46* | <10 * | Alta |
| RL-239+05-SW10 | 10/17/2006 | 13.1-14.1 | intermediate terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots, very few coarse sand very few shell fragments subrounded grains | 3C4 | SM | 27.1 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RL-239+05-SW10 | 10/17/2006 | 14.1-15.0 | intermediate terrace | 10YR 4/1 dark gray loamy coarse sand, moist, single grain, moist, loose, Non-plastic, few medium roots, few fine gravel subrounded and subangular grains few angular glossy black coarse sand | 4C4 | SM | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-239+05-SW10 | 10/17/2006 | 15.0-16.0 | intermediate terrace | 10YR 4/1 dark gray silt loam, moist, subangular blocky, moist, friable, slightly plastic, very few fine gravel very few angular glossy black coarse sand | 5C4 | ML | 24.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-242+00-SW15 | 10/21/2006 | 0.0-1.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval 1.0 to 1.9 ft. Duff layer of 0.05 ft on surface. | C1 | SP | 7.6 | 6 | 1400 | 510 | 540 | 460 | 2900 | 400 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 0.0-1.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval 1.0 to 1.9 ft. Duff layer of 0.05 ft on surface. | C1 | SP | 7.9 | 5 | 220 | 88 | 100 | 150 | 550 | 81 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 0.0-1.0 Lab Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval 1.0 to 1.9 ft. Duff layer of 0.05 ft on surface. | C1 | SP | 8.6 | 4 | 360 | 160 | 160 | 190 | 870 | 120 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 1.0-2.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval is 1.9 to 2.7 ft. 10 YR 3/ 3 (dark brown) loamy sand layer (SM) layer from 1.0 to 1.4 (actual), slightly plastic. | C1 | SP | 9.6 | 27 | 840 | 410 | 440 | 540 | 2300 | 340 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 2.0-3.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval is 2.7 to 3.4 ft. | C1 | SP | 3.2 | 4 | 4900 | 2400 | 3900 | 3500 | 15000 | 2300 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 2.0-3.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval is 2.7 to 3.4 ft. | C1 | SP | 3.4 | 4 | 4600 | 2300 | 3900 | 3400 | 14000 | 2200 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 3.0-4.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Recovery of 2.6 ft in 4 foot core. Actual sample interval 3.4 to 4.0 | C1 | SP | 1.9 | <4 | 430 | 340 | 1100 | 1100 | 2900 | 530 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 4.0-5.0 | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 4.3 to 5.25 ft. | C2 | SM | 3.4 | 7 | 1900 | 970 | 1100 | 1200 | 5100 | 720 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 5.0-6.0 | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 5.25 to 6.1. | C2 | SM | 4.9 | 11 | 13000 | 6000 | 5300 | 4500 | 28000 | 3800 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 5.0-6.0 Lab Duplicate | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 5.25 to 6.1. | C2 | SM | 4.7 | 17 | 19000 | 6200 | 6500 | 4900 | 36000 | 5000 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 5.0-6.0 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 5.25 to 6.1. | C2 | SM | 4.5 | 8 | 8700 | 3200 | 3400 | 2600 | 18000 | 2500 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-242+00-SW15 | 10/21/2006 | 6.0-7.0 | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 6.1 to 7.0 ft. | C2 | SM | 5.8 | 17 | 27000 | 9700 | 11000 | 8700 | 57000 | 8000 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 7.0-8.0 | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery is 3.5 of 4.0 foot sample. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layers throughout horizon (30% of profile) Actual sample interval is 7.0 to 8.0 ft. | C2 | SM | 4.6 | <4 | 1600 | 470 | 510 | 380 | 2900 | 400 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 8.0-9.0 | natural levee | 10YR 4/2 dark grayish brown , dry, subangular blocky, dry, slightly hard, moderately plastic, Recovery=100% | C2 | SM | 5.5 | 4 | 3600 | 1600 | 1700 | 1500 | 8300 | 1200 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 9.0-10.0 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Recovery=100% | C3 | SM | 16.4 | <4 | 20 | 8 | 5 | <4 | 34* | <10* | Dow |
| RL-242+00-SW15 | 10/21/2006 | 10.0-11.0 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Recovery=100% | C3 | SM | 18.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 11.0-12.2 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Recovery=100% | C3 | SM | 20.3 | <4 | 140 | 64 | 65 | 49 | 310 | 46 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 12.2-13.0 | natural levee | 10YR 4/1 dark gray loamy sand, moist, granular, moist, friable, slightly plastic, Recovery=100% | C4 | SM | 10.6 | 8 | 6500 | 2700 | 2700 | 2200 | 14000 | 1900 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 13.0-14.1 | natural levee | 10YR 4/1 dark gray loamy sand, moist, granular, moist, friable, slightly plastic, Recovery=100% 10YR 5/6 (yellowish brown) sand (SP), single grained, non-plastic layer 0.10 ft thick at 13.1 ft. | C4 | SM | 20.8 | <4 | 55 | 23 | 21 | 16 | 110 | 18 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 14.1-15.2 | natural levee | 10YR 3/1 very dark gray silt loam, wet, subangular blocky, moist, friable, moderately plastic, Trace of white freshwater snail shells | C5 | ML | 28.5 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RL-242+00-SW15 | 10/21/2006 | 15.2-16.0 | natural levee | 10YR 5/4 yellowish brown sand, 15-35% gravel, wet, single grain, dry, loose, Non-plastic, Trace of white freshwater snail shells | C6 | SW | 9.8 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-243+00-SW70 | 11/3/2006 | 0.0-0.3 | historic natural levee | 10YR 3/1 very dark gray fine sand, moist, granular, moist, very friable, Non-plastic, common fine roots | A1 | SP | 19.5 | 10 | 4400 | 2100 | 2100 | 1800 | 10000 | 1400 | Dow |
| RL-243+00-SW70 | 11/3/2006 | 0.3-2.4 | historic natural levee | 10YR 3/2 very dark grayish br loamy fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, Thin layer (10YR 6/3) fine sand at 1.5' | A2 | SP | 12 | 4 | 2300 | 1500 | 1300 | 1200 | 6300 | 860 | Dow |
| RL-243+00-SW70 | 11/3/2006 | 2.4-2.9 | historic natural levee | 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 8.4 | <4 | 41 | 23 | 20 | 22 | 110 | 17 | Dow |
| RL-243+00-SW70 | 11/3/2006 | 2.9-4.4 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C1 | SP | 5 | <4 | 9 | 4 | 4 | 4 | 21* | <10* | Dow |
| RL-243+00-SW70 | 11/3/2006 | 4.4-5.5 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C1 | SP | 5.9 | <4 | 35 | 18 | 18 | 16 | 86 | 14 | Dow |
| RL-243+00-SW70 | 11/3/2006 | 5.5-6.6 | historic natural levee | 10YR 3/3 dark brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic | C2 | SM | 7.4 | <4 | 40 | 20 | 20 | 19 | 100 | 16 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-243+50-SW15 | 10/21/2006 | 0.0-0.6 | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots, 2.8 feet recovery out of a 4.0 foot core. Actual sample interval is 1.1 to 1.6 ft | A1 | SM | 13.6 | 4 | 960 | 420 | 420 | 360 | 2200 | 300 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 0.6-3.0 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, Actual sample interval 1.6 to 3.0 ft | C1 | SM | 6.6 | 44 | 2600 | 690 | 860 | 1100 | 5300 | 760 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 0.6-3.0 | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, Actual sample interval 1.6 to 3.0 ft | C1 | SM | 6.4 | 43 | 3300 | 960 | 1200 | 1200 | 6700 | 980 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 3.0-5.0 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, 3.1 ft of recovery in 4.0 ft core Actual sample interval 3.0 to 5.3 ft 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layer from 3.5 to 4.0 ft | C1 | SM | 3.2 | <4 | 550 | 270 | 340 | 550 | 1700 | 240 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 3.0-5.0 | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, 3.1 ft of recovery in 4.0 ft core Actual sample interval 3.0 to 5.3 ft 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layer from 3.5 to 4.0 ft | C1 | SM | 2.8 | <4 | 440 | 240 | 320 | 640 | 1600 | 230 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 5.0-7.0 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, 3.1 ft of recovery in 4.0 ft core Actual sample interval 5.3 to 7.3 ft. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layer at 6.2 ft, thickness 0.3 ft. | C1 | SM | 6.3 | 22 | 31000 | 14000 | 14000 | 14000 | 74000 | 10000 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 5.0-7.0 | natural levee | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, slightly plastic, few fine roots, 3.1 ft of recovery in 4.0 ft core Actual sample interval 5.3 to 7.3 ft. 10 YR 5/4 (yellowish brown) fine sand (SP), single grained, non-plastic layer at 6.2 ft, thickness 0.3 ft. | C1 | SM | 6.1 | 16 | 25000 | 9300 | 12000 | 8500 | 55000 | 8100 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 7.0-8.0 | natural levee | 10YR 3/3 dark brown loam, dry, subangular blocky, moist, firm, moderately plastic, Actual sample interval 6.9 to 8.0 ft | C2 | ML | 8.5 | 18 | 28000 | 9600 | 12000 | 9300 | 59000 | 8400 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 8.0-10.0 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 3 | 13 | 17000 | 6700 | 6500 | 5300 | 35000 | 4800 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 10.0-11.8 | natural levee | 10YR 3/3 dark brown sandy clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Black charred wood 0.4 ft thick from 10.8 to 11.4 ft. | C4 | ML/CL | 16.3 | <4 | 1200 | 360 | 380 | 210 | 2100 | 290 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 11.8-13.5 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 3/3 dark brown loamy sand, moist, granular, moist, friable, Non-plastic, 100% recovery | C5 | SW | 11.6 | 10 | 4300 | 1800 | 1700 | 1500 | 9300 | 1300 | Dow |
| RL-243+50-SW15 | 10/21/2006 | 13.5-14.4 | natural levee | 10YR 3/1 very dark gray silty clay loam, moist, subangular blocky, moist, friable, moderately plastic | C6 | ML | 22.1 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-243+50-SW15 | 10/21/2006 | 14.4-15.7 | natural levee | 10YR 2/1 black , moist, single grain, moist, friable, Non-plastic, Trace white freshwater snail shells | C7 | SW | 19.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-243+50-SW15 | 10/21/2006 | 15.7-16.0 | natural levee | 10YR 4/4 dark yellowish brown sand, 15<35% gravel, moist, single grain, moist, loose, Non-plastic | C8 | SW | 13.9 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RL-244+00-SW1025 | 11/5/2006 | 0.0-0.5 | pond | 10YR 3/2 very dark grayish br and 10YR 4/3 brown loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, layered by color very few coarse sand subrounded grains | 1 | SM | 19.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-244+00-SW1025 | 11/5/2006 | 0.5-0.9 | pond | N 2/0 black very fine sandy loam, wet, granular, moist, friable, slightly plastic, few fine roots | 2 | SM | 21.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-244+00-SW1025 | 11/5/2006 | 0.9-1.2 | pond | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots, subrounded grains | 3 | SM | 19.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-245+00-SW1025 | 11/5/2006 | 0.0-0.8 | pond | N 2/0 black very fine sandy loam, wet, granular, moist, friable, slightly plastic, very few very fine roots | 1 | SM | 26.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-245+00-SW1025 | 11/5/2006 | 0.0-0.8 Field Duplicate | pond | N 2/0 black very fine sandy loam, wet, granular, moist, friable, slightly plastic, very few very fine roots | 1 | SM | 27.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-245+00-SW1025 | 11/5/2006 | 0.8-1.6 | pond | 10YR 2/1 black and 10YR 4/2 dark grayish brown very fine sandy loam, wet, granular, moist, friable, slightly plastic, very few very fine roots, layered by color | 2 | SM | 25 | 4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RL-245+00-SW1025 | 11/5/2006 | 0.8-1.6 Field Duplicate | pond | 10YR 2/1 black and 10YR 4/2 dark grayish brown very fine sandy loam, wet, granular, moist, friable, slightly plastic, very few very fine roots, layered by color | 2 | SM | 25.2 | 4 | <4 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RL-246+00-IC-C | 10/8/2006 | 0.0-0.9 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Fine and medium sand, noncohesive, subrounded grains, few coarse sand, very few fine and medium gravel, very few angular glossy black coarse sand, somewhat well sorted. | 1 | SP | 3.2 | <4 | 160 | 65 | 56 | 56 | 330 | 46 | Alta |
| RL-246+00-IC-C | 10/8/2006 | 0.9-1.2 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, Noncohesive, subrounded grains, very few medium and coarse sand, well sorted. | 2 | SP | 6.4 | <4 | 17 | 4 | 4 | 9 | 34* | <10 * | Alta |
| RL-246+00-IC-C | 10/8/2006 | 1.2-1.9 | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Medium loamy sand, noncohesive, subrounded grains, common coarse sand, very few fine gravel, few angular glossy black coarse sand, very few shell fragments. | 3 | SM | 12.8 | <4 | 30 | 5 | 5 | 8 | 47* | <10 * | Alta |
| RL-246+00-IC-C | 10/8/2006 | 1.9-2.3 | in-channel | 10YR 4/1 dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium roots, Medium and coarse sand, noncohesive, subrounded grains, common shell fragments, few fine and medium gravel, few angular glossy black coarse sand, somewhat poorly sorted. | 4 | SW | 11.1 | <4 | 37 | 6 | 8 | 7 | 59 | 10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-IC-NE | 10/8/2006 | 0.0-1.1 Field Duplicate | in-channel | 10YR 5/1 gray loamy very fine sand, wet, subangular blocky, moist, friable, very few very fine roots, vew few fine gravel very few shell fragments very few angular glossy black coarse sand and fine gravel. | 1 | SM | 18 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-246+00-IC-NE | 10/8/2006 | 0.0-1.1 | in-channel | 10YR 5/1 gray loamy very fine sand, wet, subangular blocky, moist, friable, very few very fine roots, vew few fine gravel very few shell fragments very few angular glossy black coarse sand and fine gravel. | 1 | SM | 18.4 | <4 | 18 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RL-246+00-IC-SW | 10/8/2006 | 0.0-1.6 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, fine and medium sand, noncohesive, subrounded grains, few coarse sand, fine gravel, very few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 1 | SP | 4.6 | <4 | 19 | 5 | 5 | 8 | 37* | <10 * | Alta |
| RL-246+00-IC-SW | 10/8/2006 | 1.6-1.9 | in-channel | 10YR 2/1 black , wet, moist, loose, black wood, peat, sawdust | 2 | PT | 67.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-246+00-IC-SW | 10/8/2006 | 1.9-2.5 | in-channel | 10YR 4/1 dark gray very fine sandy loam, <15% gravel, wet, subangular blocky, moist, friable, very few very fine roots | 3 | SM | 29.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-246+00-SW1025 | 11/5/2006 | 0.0-0.7 | upper high terrace | 10YR 2/1 black loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few very fine roots, subrounded grains | 1 | SM | 42.6 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RL-246+00-SW1025 | 11/5/2006 | 0.7-1.4 | upper high terrace | 10YR 2/1 black and 10YR 4/2 dark grayish brown loamy very fine sand, wet, single grain, moist, loose, Non-plastic, very few fine roots | 2 | SM | 30 | <4 | <4 | <4 | <4 | 6 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-SW130 | 8/8/2006 | 0.0-0.3 | low terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, friable, slightly plastic, very few roots, 2% roots, cohesive, fine granular structure. | A | -- | 15.8 | 11 | 350 | 160 | 180 | 220 | 930 | 140 | Dow |
| RL-246+00-SW130 | 8/8/2006 | 0.3-1.1 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, very few roots, cohesive, fine granular structure, few thin clay skins on ped faces. | Bw | -- | 14.2 | 17 | 370 | 180 | 200 | 260 | 1000 | 160 | Dow |
| RL-246+00-SW130 | 8/8/2006 | 1.1-1.8 | low terrace | 10YR 2/2 very dark brown and 10YR 5/4 yellowish brown sandy clay loam, dry, granular, dry, moderately hard, moderately plastic, 10YR 2/2 mixed with 10YR 5/4 yellowish brown and 7.5YR 4/4. Cohesive, medium subangular blocky structure. | Bc | -- | 16 | 4 | 61 | 24 | 27 | 37 | 150 | 25 | Dow |
| RL-246+00-SW130 | 8/8/2006 | 1.8-2.8 | low terrace | 7.5YR 4/3 brown sandy loam, moist, granular, moist, friable, slightly plastic, Cohesive, fine granular structure. | C | -- | 14.8 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-246+00-SW130 | 8/8/2006 | 2.8-3.4 | low terrace | 10YR 2/2 very dark brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, very few roots, 1% roots, cohesive, fine subangular blocky structure. | 2Ab | -- | 19.8 | <4 | <4 | <5 | <5 | <6 | <24 | <10 | Dow |
| RL-246+00-SW130 | 9/9/2006 | 3.4-3.9 | low terrace | 10YR 2/2 very dark brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, very few roots, 1% roots, cohesive, fine subangular blocky structure. | 2Ab | -- | 18 | <4 | 23 | 7 | 8 | 7 | 45* | <10 * | Dow |
| RL-246+00-SW130 | 9/9/2006 | 3.9-5.5 | low terrace | 7.5YR 4/4 brown loamy fine sand, dry, dry, loose, Non-plastic, Non-cohesive, well sorted | 3C | -- | 10.5 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-246+00-SW130 | 9/9/2006 | 5.5-6.5 | low terrace | 10YR 6/4 light yellowish brow sand, few 10YR 5/8 yellowish brown mottle, single grain, loose, Non-plastic, Mottles, few, fine. | C2 | SP | 5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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|---|-----------------|----------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-SW20 | 8/8/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 5/3 brown sandy loam, dry, dry, slightly hard, slightly plastic, very few roots, 0.1' well sorted fine sand on top of horizon (10YR 3/1) and 10YR 5/3 brown mixed, sandy loam, non-cohesive, well sorted. | A5 | SP | 8.9 | <4 | 430 | 200 | 210 | 250 | 1100 | 150 | Dow |
| RL-246+00-SW20 | 8/8/2006 | 0.6-1.0 | intermediate terrace | 10YR 4/2 dark grayish brown loamy sand, dry, dry, loose, Non-plastic, non-cohesive, well sorted | Bw | -- | 7.5 | 17 | 710 | 310 | 340 | 480 | 1800 | 270 | Dow |
| RL-246+00-SW20 | 8/14/2006 | 1.0-2.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 9.1 | 80 | 2200 | 820 | 770 | 1400 | 5300 | 770 | Alta |
| RL-246+00-SW20 | 8/8/2006 | 1.0-5.1 Field Duplicate | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 7.6 | 7 | 4200 | 2100 | 2000 | 2200 | 11000 | 1400 | Dow |
| RL-246+00-SW20 | 8/8/2006 | 1.0-5.1 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 7.2 | 33 | 2900 | 1600 | 1500 | 2100 | 8000 | 1100 | Dow |
| RL-246+00-SW20 | 8/14/2006 | 2.0-3.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 7.1 | 24 | 1600 | 580 | 900 | 2300 | 5300 | 760 | Alta |
| RL-246+00-SW20 | 8/15/2006 | 3.0-4.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 6.8 | <4 | 1500 | 600 | 600 | 1400 | 4100 | 540 | Alta |
| RL-246+00-SW20 | 8/15/2006 | 4.0-5.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 8.6 | 7 | 31000 | 10000 | 10000 | 7700 | 59000 | 7900 | Alta |
| RL-246+00-SW20 | 8/15/2006 | 5.0-6.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 7.4 | 22 | 110000 | 72000 | 44000 | 55000 | 280000 | 35000 | Alta |
| RL-246+00-SW20 | 8/19/2006 | 6.0-7.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/2 dark grayish brown loamy very fine sand, common mottle, moist, moist, loose, Non-plastic, 10YR 5/3 fine sand alternating with bands of 10YR 4/2 bands of loamy very fine sand. Common, medium, distinct mottles. | C2 | SP | 13 | 40 | 46000 | 26000 | 24000 | 21000 | 120000 | 16000 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-SW20 | 8/19/2006 | 7.5-8.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/2 dark grayish brown fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, 10YR 5/3 fine sand, alternating with layer of 10YR 4/2 bands fine sandy loam. Common medium distinct mottles. | C3 | SP-SM | 6.1 | 24 | 11000 | 3200 | 4000 | 2900 | 21000 | 2900 | Dow |
| RL-246+00-SW20 | 8/19/2006 | 8.5-9.5 | intermediate terrace | 10YR 5/3 brown and 2.5Y 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, 10YR 5/3 sand, SP, alternating with 2.5Y 4/1 sand (has been reduced), SP. Also layers of black woody debris at 8.6' and 8.9' to 9.2' bgs. | C4 | SP | 20.7 | <4 | 950 | 420 | 410 | 360 | 2100 | 290 | Dow |
| RL-246+00-SW20 | 8/19/2006 | 9.5-10.5 | intermediate terrace | 2.5Y 4/1 dark gray and 2.5Y 4/3 olive brown sand, single grain, loose, Non-plastic, 2.5Y 4/1 sand with narrow layer of 2.5Y 4/3 sand at 9.9' bgs. Burned and unburned wood at 9.3' and 10.2' bgs. | C5 | SW | 26.4 | 6 | 3100 | 1300 | 1200 | 840 | 6400 | 870 | Dow |
| RL-246+00-SW265 | 8/8/2006 | 0.0-0.8 | wetland | 10YR 2/1 black silt loam, moist, granular, moist, friable, slightly plastic, very few roots, 5% roots, cohesive, fine granular structure | A | -- | 34.3 | 36 | 2600 | 1300 | 1300 | 1400 | 6700 | 960 | Dow |
| RL-246+00-SW265 | 8/8/2006 | 0.8-1.1 | wetland | 10YR 3/1 very dark gray and 5YR 3/4 dark reddish brown silty clay loam, moist, subangular blocky, moist, friable, moderately plastic, very few roots, 20% 5YR 3/4 Cohesive medium subangular blocky structure. | Bt | -- | 24.4 | 9 | 4100 | 1700 | 1600 | 1500 | 8800 | 1200 | Dow |
| RL-246+00-SW265 | 8/8/2006 | 1.1-3.1 | wetland | 10YR 4/1 dark gray silty clay loam, moist, angular blocky, moist, firm, moderately plastic, 25% 5YR 3/4 mottles. Cohesive | C1 | -- | 23.5 | <5 | 430 | 250 | 230 | 230 | 1100 | 160 | Dow |
| RL-246+00-SW265 | 8/19/2006 | 3.1-4.6 | wetland | 10YR 4/1 dark gray silty clay loam, few 7.5YR 4/6 strong brown mottle, moist, moist, firm, moderately plastic, Few, medium, distinct mottles. | C2 | CL | 28.9 | <4 | 45 | 19 | 22 | 18 | 100 | 17 | Dow |
| RL-246+00-SW265 | 8/19/2006 | 4.6-5.5 | wetland | 10Y 5/1 greenish gray silty clay loam, moist, angular blocky, moist, firm, moderately plastic | C3 | CL | 28.1 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-246+00-SW330 | 8/8/2006 | 0.0-0.7 | low terrace | 10YR 2/1 black silt loam, moist, granular, moist, friable, slightly plastic, very few roots, 2% roots, cohesive, fine granular structure. | A | -- | 36.2 | 23 | 1500 | 620 | 690 | 820 | 3700 | 530 | Dow |
| RL-246+00-SW330 | 8/8/2006 | 0.7-1.5 | low terrace | 10YR 3/2 very dark grayish br silty clay loam, common 7.5YR 4/4 brown mottle, moist, subangular blocky, moist, friable, slightly plastic, very few roots, Cohesive, medium subangular blocky structure, 10% 7.5YR 4/4, brown mottles, common, medium. Thick clay skin on ped faces. | Bt | -- | 29.1 | 21 | 1400 | 730 | 730 | 870 | 3700 | 530 | Dow |
| RL-246+00-SW330 | 8/8/2006 | 1.5-3.3 | low terrace | 10YR 4/1 dark gray silty clay loam, many 7.5YR 3/4 dark brown and 7.5YR 4/6 strong brown mottle, dry, subangular blocky, dry, moderately hard, very plastic, Cohesive, coarse subangular blocky structure. | C | -- | 27.6 | <4 | 120 | 50 | 52 | 64 | 280 | 41 | Dow |
| RL-246+00-SW330 | 9/9/2006 | 3.3-3.8 | low terrace | 10YR 4/1 dark gray clay loam, common 7.5YR 4/6 strong brown mottle, wet, massive, moist, friable, moderately plastic, Mottles, 7.5YR 4/6, common, medium. | C | ML/CL | 30.3 | <4 | 27 | 14 | 14 | 16 | 71 | 12 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-SW475 | 8/7/2006 | 0.0-0.7 | low terrace | 10YR 3/3 dark brown clay loam, moist, granular, moist, very friable, moderately plastic, common fine roots | A | -- | 23.5 | 22 | 530 | 320 | 300 | 390 | 1600 | 230 | Dow |
| RL-246+00-SW475 | 8/7/2006 | 0.7-2.6 | low terrace | 10YR 3/2 very dark grayish br clay, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few roots, Mottles <2%. | Bt | -- | 15.8 | <4 | 50 | 23 | 24 | 25 | 130 | 20 | Dow |
| RL-246+00-SW475 | 8/7/2006 | 2.6-3.0 | low terrace | 10YR 4/2 dark grayish brown sandy clay, moist, granular, moist, very friable, moderately plastic, few roots, Horizon: Bcg | -- | -- | 12.4 | <4 | 21 | 12 | 13 | 15 | 61 | 11 | Dow |
| RL-246+00-SW475 | 8/7/2006 | 3.0-3.4 | low terrace | 10YR 4/2 dark grayish brown loamy sand, moist, moist, very friable, slightly plastic, few roots | C | -- | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW540 | 8/7/2006 | 0.0-0.6 | upper high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots | A | -- | 11.2 | 4 | 9 | 5 | 7 | 13 | 40* | 10* | Dow |
| RL-246+00-SW540 | 8/7/2006 | 0.6-1.2 | upper high terrace | 10YR 4/4 dark yellowish brown loamy sand, dry, single grain, dry, loose, slightly plastic, few roots | E | -- | 4.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW540 | 8/7/2006 | 1.2-1.8 | upper high terrace | 10YR 4/4 dark yellowish brown clay, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, few roots, <2% gravel, <1 cm. Dark black deposits. | B | -- | 12.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW540 | 8/7/2006 | 1.8-2.3 | upper high terrace | 10YR 3/4 dark yellowish brown sandy loam, dry, subangular blocky, dry, loose, slightly plastic, few roots | BC | -- | 6.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW540 | 8/7/2006 | 2.3-3.0 | upper high terrace | 10YR 4/6 dark yellowish brown loamy sand, <15% gravel, dry, subangular blocky, dry, hard, slightly plastic, few roots, Gravel, <1 cm, 2-5%. | C | -- | 5.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW725 | 8/6/2006 | 0.0-1.2 | upper high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots | A | -- | 15 | 7 | 12 | 6 | 9 | 15 | 48* | 14* | Dow |
| RL-246+00-SW725 | 8/7/2006 | 1.2-2.8 | upper high terrace | 10YR 4/4 dark yellowish brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, few fine roots | B | -- | 11.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW725 | 8/7/2006 | 2.8-3.2 | upper high terrace | 10YR 4/2 dark grayish brown and 10YR 4/1 dark gray clay, few 10YR 5/6 yellowish brown mottle, <15% gravel, moist, subangular blocky, moist, firm, few roots, Gleying 10YR 4/1, gravel, <1 cm diameter, <2% volume, orange mottles. Black deposits (sample retained). Horizon: Btg | -- | -- | 12 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-246+00-SW825 | 11/5/2006 | 0.0-0.5 | pond | 2.5Y 3/2 very dark grayish br loamy sand, wet, single grain, moist, loose, Non-plastic, few very fine roots, common fine gravel subrounded grains | 1 | SM | 28.8 | <4 | 5 | 4 | <4 | <4 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+00-SW85 | 8/8/2006 | 0.0-0.6 | high terrace | 10YR 3/1 very dark gray fine sand, dry, dry, loose, Non-plastic, very few roots, Trace roots, non-cohesive, well sorted | A | -- | 10.7 | 15 | 6800 | 3400 | 2800 | 2600 | 16000 | 2100 | Dow |
| RL-246+00-SW85 | 8/8/2006 | 0.6-1.5 | high terrace | 10YR 4/2 dark grayish brown fine sand, dry, dry, loose, Non-plastic, Non-cohesive, well sorted | Bw | -- | 4.7 | <4 | 1400 | 660 | 650 | 550 | 3300 | 460 | Dow |
| RL-246+00-SW85 | 8/8/2006 | 1.5-2.2 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown fine sand, dry, dry, loose, Non-plastic, Non-cohesive, well sorted | C1 | -- | 1.2 | <4 | 310 | 140 | 140 | 120 | 710 | 100 | Dow |
| RL-246+00-SW85 | 8/15/2006 | 2.2-3.3 | high terrace | 7.5YR 4/6 strong brown sand, moist, single grain, dry, loose, Non-plastic, few roots | C2 | -- | 3.6 | <4 | <6 | <4 | <4 | <4 | <22 | <10 | Alta |
| RL-246+00-SW85 | 8/15/2006 | 3.3-4.0 | high terrace | 7.5YR 3/3 dark brown sand, moist, single grain, dry, loose, Non-plastic, few roots | C3 | -- | 4.1 | <4 | 30 | 14 | 11 | 9 | 64 | 11 | Alta |
| RL-246+00-SW85 | 8/15/2006 | 4.0-4.9 | high terrace | 7.5YR 3/3 dark brown sand, moist, single grain, dry, loose, Non-plastic, few roots | C3 | -- | 5.6 | <4 | 220 | 82 | 72 | 64 | 440 | 59 | Alta |
| RL-246+00-SW85 | 9/9/2006 | 4.9-5.9 Lab Duplicate | high terrace | 7.5YR 3/3 dark brown loamy sand, moist, single grain, moist, very friable, slightly plastic, few roots, Few white shells at ~6.4' about 1 cm thick, <0.5 cm diameter. | C4 | SM | 6.5 | <4 | 19 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-246+00-SW85 | 9/9/2006 | 4.9-5.9 | high terrace | 7.5YR 3/3 dark brown loamy sand, moist, single grain, moist, very friable, slightly plastic, few roots, Few white shells at ~6.4' about 1 cm thick, <0.5 cm diameter. | C4 | SM | 7.1 | <4 | 10 | 5 | 5 | 4 | 23 | <10 * | Dow |
| RL-246+00-SW85 | 9/9/2006 | 5.9-6.8 | high terrace | 7.5YR 3/3 dark brown loamy sand, moist, single grain, moist, very friable, slightly plastic, few roots, Few white shells at ~6.4' about 1 cm thick, <0.5 cm diameter. | C4 | SM | 5.3 | <4 | 27 | 12 | 11 | 10 | 60 | 11 | Dow |
| RL-246+00-SW85 | 9/9/2006 | 6.8-8.0 | high terrace | 7.5YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, White shells throughout, <1% volume, <0.5 cm diameter. | C5 | ML | 9.8 | <4 | 9 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-246+00-SW925 | 11/5/2006 | 0.0-1.2 | pond | N 2/0 black and 2.5Y 3/2 very dark grayish br silt loam, wet, massive, moist, friable, slightly plastic, very few very fine roots | 1 | ML | 66.2 | 25 | 19 | 10 | 13 | 39 | 110 | 39 | Alta |
| RL-246+00-SW925 | 11/5/2006 | 0.0-1.2 Field Duplicate | pond | N 2/0 black and 2.5Y 3/2 very dark grayish br silt loam, wet, massive, moist, friable, slightly plastic, very few very fine roots | 1 | ML | 65.3 | 28 | 22 | 11 | 17 | 35 | 110 | 43 | Alta |
| RL-246+00-SW925 | 11/5/2006 | 1.2-1.7 | pond | 2.5Y 4/2 dark grayish brown silt loam, wet, subangular blocky, moist, friable, moderately plastic, distinct visible layers | 2 | ML | 35.4 | <4 | 15 | 7 | 5 | 4 | 31 * | <10 * | Alta |
| RL-246+00-SW925 | 11/5/2006 | 1.2-1.7 Lab Duplicate | pond | 2.5Y 4/2 dark grayish brown silt loam, wet, subangular blocky, moist, friable, moderately plastic, distinct visible layers | 2 | ML | 35.4 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+05-SW20 | 10/11/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 5/3 brown sandy loam, dry, dry, slightly hard, slightly plastic, very few roots, 0.1' well sorted fine sand on top of horizon (10YR 3/1) and 10YR 5/3 brown mixed, sandy loam, non-cohesive, well sorted. | A5 | SP | 11.5 | 8 | 1600 | 380 | 450 | 340 | 2800 | 380 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 0.6-1.0 | intermediate terrace | 10YR 4/2 dark grayish brown loamy sand, dry, dry, loose, Non-plastic, non-cohesive, well sorted | Bw | -- | 10.5 | 120 | 1900 | 940 | 900 | 1200 | 5000 | 800 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 0.6-1.0 Lab Duplicate | intermediate terrace | 10YR 4/2 dark grayish brown loamy sand, dry, dry, loose, Non-plastic, non-cohesive, well sorted | Bw | -- | 11 | 100 | 1600 | 670 | 740 | 1100 | 4200 | 680 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 1.0-2.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 7.6 | 27 | 2800 | 1100 | 1100 | 1600 | 6700 | 930 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 2.0-3.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 5.1 | 7 | 2000 | 940 | 1000 | 1800 | 5900 | 810 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 3.0-4.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 5.9 | 8 | 4200 | 1200 | 1300 | 1400 | 8000 | 1100 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 4.0-5.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 6.3 | 7 | 7300 | 2900 | 2900 | 2900 | 16000 | 2200 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 5.0-6.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, dry, dry, loose, Non-plastic, Mixed 10YR 4/2 and 10YR 5/3 alternating bands, fine sand, non-cohesive, well sorted. Flood deposits alternate some layers of sandy loam 10YR 4/2. Black specks noted in sand, less at bottom of profile. | C | -- | 8 | 80 | 110000 | 41000 | 51000 | 33000 | 240000 | 34000 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 6.0-7.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/2 dark grayish brown loamy very fine sand, common mottle, moist, moist, loose, Non-plastic, 10YR 5/3 fine sand alternating with bands of 10YR 4/2 bands of loamy very fine sand. Common, medium, distinct mottles. | C2 | SP | 8.7 | 27 | 50000 | 20000 | 22000 | 17000 | 110000 | 15000 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 7.5-8.5 | intermediate terrace | 10YR 5/3 brown and 10YR 4/2 dark grayish brown fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, 10YR 5/3 fine sand, alternating with layer of 10YR 4/2 bands fine sandy loam. Common medium distinct mottles. | C3 | SP-SM | 15.7 | 130 | 49000 | 14000 | 30000 | 13000 | 110000 | 17000 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-246+05-SW20 | 10/11/2006 | 8.5-9.5 | intermediate terrace | 10YR 5/3 brown and 2.5Y 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, 10YR 5/3 sand, SP, alternating with 2.5Y 4/1 sand (has been reduced), SP. Also layers of black woody debris at 8.6' and 8.9' to 9.2' bgs. | C4 | SP | 29.7 | 7 | 4300 | 1700 | 1600 | 1100 | 8600 | 1200 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 9.5-10.5 | intermediate terrace | 2.5Y 4/1 dark gray and 2.5Y 4/3 olive brown sand, single grain, loose, Non-plastic, 2.5Y 4/1 sand with narrow layer of 2.5Y 4/3 sand at 9.9' bgs. Burned and unburned wood at 9.3' and 10.2' bgs. | C5 | SW | 21.3 | <4 | 580 | 250 | 230 | 180 | 1200 | 170 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 10.5-11.8 | intermediate terrace | 2.5Y 4/1 dark gray fine sandy loam, wet, subangular blocky, moist, friable, Non-plastic, Wood fragments from 10.9 to 11.2 and 11.6 to 11.7 feet. | C6 | SM | 35.7 | <4 | 140 | 68 | 60 | 49 | 320 | 45 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 11.8-12.9 | intermediate terrace | 2.5Y 4/1 dark gray silty clay loam, wet, massive, moist, firm, moderately plastic, Slightly sandier thin layer from 12.4 to 12.5 feet. | C7 | ML/CL | 26.9 | <4 | 9 | 5 | 4 | <4 | <20 * | <10 * | Dow |
| RL-246+05-SW20 | 10/11/2006 | 12.9-13.5 | intermediate terrace | 2.5Y 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, 95% black (10YR 2/1) wood fragments with thin layers of sand above and below. | C8 | SP | 39.8 | <4 | 33 | 18 | 17 | 14 | 84 | 14 | Dow |
| RL-246+05-SW20 | 10/11/2006 | 13.5-15.0 | intermediate terrace | 2.5Y 4/1 dark gray fine sandy loam, wet, structureless, moist, friable, moderately plastic, Largely fine sandy loam but with some layers of silty clay loam and loamy fine sand. Wood fragment at 14.9 feet. | C9 | SM | 35.2 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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"MI" indicates elevated reporting limit due to matrix interference.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-249+00-SW10 | 10/22/2006 | 0.0-0.6 Lab Duplicate | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots, 1.8' recovery for a 4' sample core. | A | SM | 18.4 | 37 | 1900 | 770 | 890 | 1100 | 4700 | 690 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 0.0-0.6 | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, friable, slightly plastic, few fine roots, 1.8' recovery for a 4' sample core. | A | SM | 18.1 | 38 | 2400 | 990 | 1000 | 1300 | 5700 | 820 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 0.6-4.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, 1.8' recovery for a 4' sample core. | C1 | SP | 4.9 | 23 | 30000 | 9200 | 12000 | 8000 | 59000 | 8300 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 0.6-4.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, 1.8' recovery for a 4' sample core. | C1 | SP | 4.9 | 25 | 29000 | 9900 | 11000 | 8000 | 58000 | 8000 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 4.0-6.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 2.5' recovery for a 4' sample core. | C1 | SP | 3.2 | 25 | 51000 | 17000 | 19000 | 14000 | 100000 | 14000 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 4.0-6.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 2.5' recovery for a 4' sample core. | C1 | SP | 3.3 | 32 | 57000 | 23000 | 22000 | 18000 | 120000 | 16000 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 6.0-8.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 2.5' recovery for a 4' sample core. Partially decomposed plant roots noted. | C1 | SP | 5.5 | 16 | 25000 | 10000 | 12000 | 7600 | 54000 | 7900 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 6.0-8.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 2.5' recovery for a 4' sample core. Partially decomposed plant roots noted. | C1 | SP | 4.4 | 16 | 20000 | 7400 | 10000 | 6500 | 44000 | 6500 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 8.0-10.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 4.0' recovery for a 4' sample core. | C1 | SP | 3.4 | 53 | 43000 | 13000 | 27000 | 10000 | 94000 | 15000 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 8.0-10.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 4.0' recovery for a 4' sample core. | C1 | SP | 4.1 | 24 | 32000 | 11000 | 15000 | 8800 | 67000 | 9800 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 10.0-11.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 4.0' recovery for a 4' sample core. 10 YR 4/4 (dark yellowish brown), sandy loam (SM), moderately plastic from 10.0-10.5'.---- | C1 | SP | 7 | 15 | 7900 | 1800 | 2800 | 1600 | 14000 | 2000 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 11.0-12.0 | natural levee | 10YR 5/4 yellowish brown and 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, 4.0' recovery for a 4' sample core. 10 YR 2/1 (black) wood layers throughout interval, 10 YR 5/8 (yellowish brown) color from 11.5-11.7'. Occasional 10 YR 4/4 (dark yellowish brown) sandy loam (SM) layers about 0.05' thickness.---- | C2 | SP | 18.4 | <4 | 89 | 22 | 25 | 14 | 150 | 23 | Dow |
| RL-249+00-SW10 | 10/22/2006 | 12.0-14.9 | natural levee | 10YR 3/1 very dark gray sandy loam, wet, subangular blocky, moist, friable, moderately plastic, 3.0' recovery on a 4' sample core. 10YR 2/1 (black) wood layers less than 0.05' thick. | C3 | SM | 14.1 | <4 | 27 | 8 | 6 | <4 | 42* | <10 * | Dow |
| RL-249+00-SW10 | 10/22/2006 | 14.9-15.6 | natural levee | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, 3.0' recovery on a 4' sample core. 10YR 2/1 (black) wood layer from 14.9-15.3'. | C4 | SP | 32.8 | <4 | 31 | 6 | 5 | <8 ^{LSVR} | 41* | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-249+00-SW10 | 10/22/2006 | 15.6-16.0 | natural levee | 10YR 4/1 dark gray coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, 3.0' recovery on a 4' sample core. Abundant white fresh water snail shells. | C5 | SW | 15.1 | <4 | 9 | <4 | <4 | <8 ^{LISR} | <24 [*] | <10 [*] | Dow |
| RL-249+00-SW420 | 11/3/2006 | 0.0-0.4 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, moderately plastic, common very fine roots | A1 | ML/CL | 26.2 | 11 | 140 | 79 | 83 | 140 | 440 | 72 | Dow |
| RL-249+00-SW420 | 11/3/2006 | 0.0-0.4 Lab Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, moderately plastic, common very fine roots | A1 | ML/CL | 27.9 | 13 | 170 | 100 | 100 | 150 | 540 | 87 | Dow |
| RL-249+00-SW420 | 11/3/2006 | 0.4-1.5 | low terrace | 10YR 4/2 dark grayish brown clay loam, few 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moderate, moist, firm, very plastic, very few fine roots | A2 | CL | 18.2 | <4 | 68 | 35 | 35 | 46 | 190 | 27 | Dow |
| RL-249+00-SW420 | 11/3/2006 | 1.5-2.0 | low terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown fine sandy loam, many 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moderate, moist, friable, slightly plastic | Bw | SC | 17.6 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RL-249+00-SW420 | 11/3/2006 | 2.0-3.3 | low terrace | 10YR 6/2 light brownish gray loamy fine sand, common 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, very friable, Non-plastic | 2C | SP | 16 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RL-252+00-IC-C | 10/8/2006 | 0.0-0.3 | in-channel | 10YR 4/3 brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, fine gravel, very few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 1 | SP | 2 | <4 | 14 | <4 | <4 | 36 | 50 [*] | <10 [*] | Alta |
| RL-252+00-IC-C | 10/8/2006 | 0.3-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few medium and coarse sand, fine gravel, very few angular glossy black coarse sand, somewhat well sorted | 2 | SP | 3.2 | <4 | 12 | <4 | <4 | 6 | <20 [*] | <10 [*] | Alta |
| RL-252+00-IC-C | 10/8/2006 | 0.6-1.0 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium sand, noncohesive, subrounded grains, few coarse sand, fine gravel, few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 3 | SP | 7.4 | 4 | 270 | 160 | 94 | 360 | 890 | 110 | Alta |
| RL-252+00-IC-C | 10/8/2006 | 1.0-1.6 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, fine and medium gravel, few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 4 | SP | 11.1 | <4 | 260 | 300 | 140 | 680 | 1400 | 160 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-252+00-IC-NE | 10/8/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few coarse roots, fine and medium sand, noncohesive, subrounded grains, few coarse sand, fine gravel, roots/black material, very few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 1 | SP | 6.3 | <4 | 200 | 17 | 19 | 7 | 240 | 31 | Alta |
| RL-252+00-IC-NE | 10/8/2006 | 0.3-0.8 | in-channel | 10YR 4/2 dark grayish brown loamy sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, noncohesive, subrounded grains, few coarse sand, fine gravel, very few angular glossy black coarse sand and fine gravel | 2 | SM | 11 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RL-252+00-IC-NE | 10/8/2006 | 0.8-1.2 | in-channel | 10YR 3/1 very dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, medium and coarse sand, noncohesive, subrounded grains, fine and medium gravel, few shell fragments, few angular glossy black coarse sand and fine gravel | 3 | SM | 10.2 | <4 | 12 | <4 | <4 | 6 | <20 * | <10 * | Alta |
| RL-252+00-IC-SW | 10/8/2006 | 0.0-1.5 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand, noncohesive, subrounded grains, few coarse sand, few shell fragments, very few angular glossy black coarse sand, somewhat well sorted | 1 | SP | 4.5 | <4 | 45 | 23 | 11 | 40 | 120 | 15 | Alta |
| RL-252+00-IC-SW | 10/8/2006 | 1.5-2.2 | in-channel | 10YR 4/1 dark gray silt loam, wet, subangular blocky, moist, friable, slightly plastic, common medium roots, cohesive, medium and coarse roots/black material, very few shell fragments, layers of roots/black material at 1.6' and 2.1' | 2 | ML | 28.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-252+00-SW30 | 8/9/2006 | 0.0-0.3 | high terrace | 10YR 3/2 very dark grayish br sand, dry, dry, loose, Non-plastic, common fine roots, Common, very fine, medium, and fine roots Field sample duplicate collected. | 2A2 | -- | 15.3 | 12 | 7600 | 3400 | 3300 | 2800 | 17000 | 2400 | Dow |
| RL-252+00-SW30 | 8/9/2006 | 0.0-0.3 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br sand, dry, dry, loose, Non-plastic, common fine roots, Common, very fine, medium, and fine roots Field sample duplicate collected. | 2A2 | -- | 14.7 | 13 | 7700 | 3200 | 3500 | 3200 | 18000 | 2500 | Dow |
| RL-252+00-SW30 | 8/9/2006 | 0.3-0.9 | high terrace | 10YR 4/3 brown sand, dry, dry, loose, Non-plastic, few fine roots | AE | -- | 3.9 | <4 | 2600 | 1100 | 1100 | 760 | 5600 | 760 | Dow |
| RL-252+00-SW30 | 8/9/2006 | 0.9-1.9 | high terrace | 10YR 5/4 yellowish brown , dry, dry, loose, Non-plastic | E | -- | 2.8 | 5 | 1900 | 360 | 460 | 220 | 2900 | 400 | Dow |
| RL-252+00-SW30 | 8/9/2006 | 1.9-3.1 | high terrace | 10YR 4/6 dark yellowish brown sand, dry, dry, loose, Non-plastic, very few medium roots | Bs | -- | 3.7 | <4 | 20 | 8 | 8 | 7 | 42* | <10 * | Dow |
| RL-252+00-SW30 | 8/9/2006 | 3.1-5.0 | high terrace | 10YR 5/6 yellowish brown sand, dry, dry, loose, Non-plastic, Lab sample duplicate collected. | 2C1 | -- | 4.2 | <4 | 9 | 5 | 6 | 7 | 28* | <10 * | Dow |
| RL-252+00-SW30 | 8/9/2006 | 3.1-5.0 Lab Duplicate | high terrace | 10YR 5/6 yellowish brown sand, dry, dry, loose, Non-plastic, Lab sample duplicate collected. | 2C1 | -- | 4.6 | <4 | 16 | 9 | 9 | 12 | 46* | <10 * | Dow |
| RL-252+00-SW30 | 8/9/2006 | 5.0-5.5 | high terrace | 10YR 4/4 dark yellowish brown sand, moist, moist, loose, Non-plastic | C2 | -- | 6.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-252+00-SW320 | 8/9/2006 | 0.0-1.1 Field Duplicate | wetland | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, firm, moderately plastic, common very fine roots, Common, very fine and fine roots. Field sample duplicate collected. | A1 | -- | 26.6 | 14 | 790 | 390 | 400 | 530 | 2100 | 310 | Dow |
| RL-252+00-SW320 | 8/9/2006 | 0.0-1.1 | wetland | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, firm, moderately plastic, common very fine roots, Common, very fine and fine roots. Field sample duplicate collected. | A1 | -- | 26.7 | 13 | 780 | 390 | 380 | 430 | 2000 | 290 | Dow |
| RL-252+00-SW320 | 8/9/2006 | 1.1-2.2 | wetland | 10YR 2/1 black loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Few fine faint mottles | A2 | -- | 29 | 5 | 720 | 370 | 350 | 400 | 1800 | 260 | Dow |
| RL-252+00-SW320 | 8/9/2006 | 2.2-4.0 Field Duplicate | wetland | 10Y 5/1 greenish gray silty clay loam, common 10YR 5/8 yellowish brown mottle, subangular blocky, firm, moderately plastic, Common, distinct mottles. Firm to very firm. Subangular blocky to massive. Field sample duplicate collected. | Cg1 | -- | 19.9 | 34 | <4 | <4 | <4 | <4 | 34* | 34* | Dow |
| RL-252+00-SW320 | 8/9/2006 | 2.2-4.0 | wetland | 10Y 5/1 greenish gray silty clay loam, common 10YR 5/8 yellowish brown mottle, subangular blocky, firm, moderately plastic, Common, distinct mottles. Firm to very firm. Subangular blocky to massive. Field sample duplicate collected. | Cg1 | -- | 20.7 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RL-252+00-SW320 | 8/9/2006 | 4.0-4.2 | wetland | 10Y 5/1 greenish gray loamy sand, wet, single grain, moist, loose, Non-plastic, Single grained to subangular blocky | Cg2 | -- | 20.6 | <4 | 11 | 5 | <4 | 9 | 25* | <10* | Dow |
| RL-252+00-SW410 | 8/15/2006 | 0.0-1.0 | low terrace | 10YR 3/2 very dark grayish br loamy sand, dry, granular, dry, soft, Non-plastic, many very fine roots, Many, very fine roots, especially in upper 0.8' | Ap | -- | 7.3 | 6 | 50 | 29 | 33 | 46 | 160 | 29 | Dow |
| RL-252+00-SW410 | 8/15/2006 | 1.0-1.8 | low terrace | 10YR 5/6 yellowish brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | E | -- | 7.4 | <4 | 18 | 10 | 12 | 16 | 56 | 10 | Dow |
| RL-252+00-SW410 | 8/15/2006 | 1.8-2.9 | low terrace | 10YR 5/8 yellowish brown and 10YR 5/2 grayish brown very fine sandy loam, common mottle, moist, subangular blocky, moist, friable, slightly plastic, very few roots, Oxidized areas around root traces. Reduced areas 10YR 5/2. | Bt1 | -- | 17.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-252+00-SW410 | 8/15/2006 | 2.9-4.2 | low terrace | 10YR 5/8 yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic | Bt2 | -- | 15.3 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RL-252+00-SW410 | 8/15/2006 | 4.2-4.6 | low terrace | 2.5Y 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, Alternating sand and fine sandy loam. | Cg | -- | 20.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-252+00-SW495 | 8/15/2006 | 0.0-0.9 | upper high terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots | Ap | -- | 6.8 | 6 | 12 | 6 | 11 | 16 | 52 | 14 | Dow |
| RL-252+00-SW495 | 8/15/2006 | 0.9-2.2 | upper high terrace | 10YR 6/6 brownish yellow fine sand, dry, single grain, dry, loose, Non-plastic | Bw | -- | 4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-252+00-SW495 | 8/15/2006 | 2.2-3.1 | upper high terrace | 10YR 5/4 yellowish brown fine sandy loam, few mottle, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, Few, medium, faint mottles, medium gravel 2-20%. | 2C | -- | 13.4 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-252+00-SW5 | 8/9/2006 | 0.0-0.4 Lab Duplicate | floodplain | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, many very fine roots, Horizon: Overbank flood deposits. Lab sample duplicate collected. | 22 | -- | 10.4 | <4 | 160 | 41 | 50 | 37 | 290 | 42 | Dow |
| RL-252+00-SW5 | 8/9/2006 | 0.0-0.4 | floodplain | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, many very fine roots, Horizon: Overbank flood deposits. Lab sample duplicate collected. | 22 | -- | 9.1 | <4 | 91 | 36 | 53 | 40 | 220 | 35 | Dow |
| RL-252+00-SW5 | 8/9/2006 | 0.4-1.4 | floodplain | 10YR 4/2 dark grayish brown loamy fine sand, common 7.5YR 5/8 strong brown mottle, moist, moist, very friable, slightly plastic, common medium roots, common, medium mottles. Common, fine, medium, and coarse roots. | -- | -- | 20.6 | 8 | 550 | 200 | 220 | 220 | 1200 | 170 | Dow |
| RL-252+00-SW5 | 8/9/2006 | 1.4-3.0 | floodplain | 2.5Y 4/2 dark grayish brown fine sandy loam, few 7.5YR 5/8 strong brown mottle, moist, moist, friable, moderately plastic, few medium roots, moist to wet. Few faint medium mottles. Few medium and coarse roots. | C1 | -- | 25 | 56 | 1200 | 530 | 770 | 2600 | 5100 | 740 | Dow |
| RL-252+00-SW5 | 8/9/2006 | 3.0-4.5 | floodplain | N 3/0 very dark gray sand, wet, moist, loose, Non-plastic, Sand and loamy fine sand (lenses), non-plastic (sand) and slightly plastic (loamy fine sand) Fresh clam shells. | Cg2 | -- | 34.2 | 150 | 5000 | 3700 | 2600 | 2900 | 14000 | 2000 | Dow |
| RL-252+00-SW70 | 8/9/2006 | 0.0-1.5 | intermediate terrace | 10YR 3/1 very dark gray loam, moist, moist, firm, moderately plastic, few very fine roots, Few, very fine and fine roots. | A | -- | 15.8 | 12 | 1100 | 530 | 510 | 580 | 2700 | 380 | Dow |
| RL-252+00-SW70 | 8/9/2006 | 1.5-3.1 | intermediate terrace | 10YR 4/3 brown sandy loam, few 10YR 5/8 yellowish brown mottle, moist, moist, friable, slightly plastic, Few, fine, faint, mottles | C1 | -- | 14.4 | <4 | 41 | 19 | 19 | 16 | 95 | 16 | Dow |
| RL-252+00-SW70 | 8/9/2006 | 3.1-3.3 Field Duplicate | intermediate terrace | N 2/0 black silty clay loam, moist, moist, firm, moderately plastic, Field sample duplicate collected. | 2C2 | -- | 18.8 | <4 | <4 | <4 | 4 | 4 | <20 * | <10 * | Dow |
| RL-252+00-SW70 | 8/9/2006 | 3.1-3.3 | intermediate terrace | N 2/0 black silty clay loam, moist, moist, firm, moderately plastic, Field sample duplicate collected. | 2C2 | -- | 19.8 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-252+00-SW70 | 8/9/2006 | 3.3-3.7 | intermediate terrace | 2.5Y 4/4 olive brown silt loam, common 10YR 5/8 yellowish brown mottle, wet, moist, firm, moderately plastic, Silt loam to silty clay loam. Common medium mottles. | 2C3 | -- | 17.7 | <4 | 4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RL-252+00-SW70 | 9/9/2006 | 3.7-4.7 | intermediate terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 6/8 brownish yellow mottle, wet, massive, moist, firm, moderately plastic, Mottles (faint), medium. Returned to location on Sept. 9, 2006 to go 3.7-4.7' bgs. | 2C3 | ML/CL | 20.1 | <4 | 12 | 6 | <4 | 6 | 24* | <10 * | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-252+00-SW730 | 8/15/2006 | 0.0-1.1 | low terrace | 10YR 2/1 black sandy loam, dry, granular, dry, slightly hard, Non-plastic, many fine roots, Many, very fine, fine, and medium roots. | A | -- | 35.3 | 29 | 31 | 13 | 22 | 54 | 150 | 48 | Alta |
| RL-252+00-SW730 | 8/15/2006 | 1.1-2.3 | low terrace | 2.5YR 4/3 reddish brown sandy loam, few mottle, <15% gravel, wet, single grain, moist, friable, Non-plastic, few fine roots, 5-10% fine and medium gravel. Few, medium, faint mottles. | Bw | -- | 17.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-252+00-SW730 | 8/15/2006 | 2.3-3.3 | low terrace | N 5/0 gray coarse sandy loam, friable, slightly plastic, Coarse sandy loam with lenses of sandy clay loam (moderately plastic for lenses). 5-10% fine and medium gravel. | Cg | -- | 11.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-252+05-SW5 | 10/22/2006 | 0.0-0.4 | floodplain | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, many very fine roots. Horizon: Overbank flood deposits. Lab sample duplicate collected. | 22 | -- | 12.3 | <4 | 280 | 30 | 38 | 32 | 380 | 50 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 0.4-1.4 | floodplain | 10YR 4/2 dark grayish brown loamy fine sand, common 7.5YR 5/8 strong brown mottle, moist, moist, very friable, slightly plastic, common medium roots, common, medium mottles. Common, fine, medium, and coarse roots. | -- | -- | 20.3 | <4 | 420 | 140 | 150 | 120 | 820 | 120 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 1.4-3.0 | floodplain | 2.5Y 4/2 dark grayish brown fine sandy loam, few 7.5YR 5/8 strong brown mottle, moist, moist, friable, moderately plastic, few medium roots, moist to wet. Few faint medium mottles. Few medium and coarse roots. | C1 | -- | 27.3 | 44 | 1800 | 1100 | 900 | 1700 | 5600 | 770 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 3.0-4.5 | floodplain | N 3/0 very dark gray sand, wet, moist, loose, Non-plastic, Sand and loamy fine sand (lenses), non-plastic (sand) and slightly plastic (loamy fine sand) Fresh clam shells. | Cg2 | -- | 35 | 650 | 710 | 460 | 480 | 1100 | 3400 | 1100 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 4.5-6.0 | floodplain | 5Y 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, petrochemical odor, decaying wood fragments at 4.5' | Cg3 | SP | 19.2 | 19 | 1700 | 1100 | 860 | 860 | 4500 | 620 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 6.0-7.4 | floodplain | 5Y 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, petrochemical odor, geoprobe core 4-8', recovery 1.3%*** | Cg3 | SP | 16.7 | <4 | 870 | 300 | 370 | 520 | 2100 | 290 | Dow |
| RL-252+05-SW5 | 10/22/2006 | 7.4-8.0 | floodplain | 2.5Y 4/1 dark gray silt loam, wet, structureless, moist, very friable, slightly plastic | Cg4 | ML | 28.2 | <4 | 65 | 26 | 28 | 35 | 150 | 23 | Dow |

NOTES:

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"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-255+00-SW15 | 10/22/2006 | 0.0-0.5 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, moderately plastic, common fine roots, 3.0' recovery on a 4' sample core. | A | SM | 22.7 | 66 | 2300 | 990 | 1100 | 1400 | 5900 | 880 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 0.5-1.5 | natural levee | 10YR 4/1 dark gray loamy sand, moist, granular, moist, friable, Non-plastic, few fine roots, 3.0' recovery on a 4' sample core. | C1 | SM | 11.1 | 8 | 12000 | 5900 | 6200 | 6300 | 31000 | 4300 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 1.5-4.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.0' recovery on a 4' sample core. | C2 | SP | 3.5 | 26 | 37000 | 14000 | 14000 | 12000 | 77000 | 11000 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 1.5-4.0 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.0' recovery on a 4' sample core. | C2 | SP | 3.2 | 29 | 37000 | 14000 | 14000 | 8700 | 73000 | 10000 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 4.0-5.5 Field Duplicate | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.3' recovery on a 4' sample core. 10 YR 3/2 (very dark grayish brown) loamy sand (SM) 4.8-5.0'. | C2 | SP | 2.7 | 15 | 16000 | 5900 | 5700 | 4300 | 32000 | 4300 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 4.0-5.5 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.3' recovery on a 4' sample core. 10 YR 3/2 (very dark grayish brown) loamy sand (SM) 4.8-5.0'. | C2 | SP | 3.9 | 15 | 19000 | 6500 | 6900 | 4900 | 38000 | 5200 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 5.5-9.0 Field Duplicate | natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.3' recovery on a 4' sample core. 3.0' recovery on a 4' sample core (8-12'). | C3 | SP | 3.4 | 7 | 4700 | 1300 | 1300 | 750 | 8000 | 1100 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 5.5-9.0 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, 3.3' recovery on a 4' sample core. 3.0' recovery on a 4' sample core (8-12'). | C3 | SP | 4.2 | <4 | 1800 | 670 | 650 | 460 | 3600 | 490 | Dow |
| RL-255+00-SW15 | 10/22/2006 | 9.0-12.0 Field Duplicate | natural levee | 10YR 5/4 yellowish brown coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, 3.0' recovery on a 4' sample core. | C4 | SW | 6.7 | <4 | 9 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-255+00-SW15 | 10/22/2006 | 9.0-12.0 | natural levee | 10YR 5/4 yellowish brown coarse sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, 3.0' recovery on a 4' sample core. | C4 | SW | 5.7 | <4 | 14 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RL-255+00-SW15 | 10/22/2006 | 12.0-14.3 | natural levee | 10YR 4/6 dark yellowish brown and 10YR 3/4 dark yellowish brown coarse sand, 15-35% gravel, wet, single grain, moist, loose, Non-plastic, 2.6' recovery on a 4' sample core. Matrix predominately gravel 14.0-14.3'. | C5 | SW | 11.9 | <4 | 13 | 5 | 4 | 4 | 26* | <10 * | Dow |
| RL-255+00-SW15 | 10/22/2006 | 14.3-15.5 | natural levee | 10YR 5/4 yellowish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, 2.6' recovery on a 4' sample core. Matrix predominately gravel from 15.3-15.5'. | C6 | SP | 13.6 | <4 | 7 | <4 | <4 | <6 ^{LISR} | <22 * | <10 * | Dow |
| RL-255+00-SW15 | 10/22/2006 | 15.5-16.0 | natural levee | 10Y 4/1 dark greenish gray silt loam, wet, massive, moist, firm, moderately plastic, 2.6' recovery on a 4' sample core. | C7 | ML | 15.4 | <4 | 26 | 6 | 5 | <4 | 37* | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-256+00-SW120 | 11/4/2006 | 0.0-0.9 | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, slightly plastic, few very fine roots | A1 | ML/CL | 17.4 | 13 | 1100 | 460 | 420 | 510 | 2500 | 340 | Alta |
| RL-256+00-SW120 | 11/4/2006 | 0.9-2.0 | low terrace | 10YR 3/1 very dark gray and 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A2 | ML/CL | 20.4 | <4 | 96 | 43 | 35 | 55 | 230 | 33 | Alta |
| RL-256+00-SW120 | 11/4/2006 | 2.0-3.3 | low terrace | 10YR 4/2 dark grayish brown loamy fine sand, few 10YR 4/4 dark yellowish brown mottle, moist, subangular blocky, weak, moist, very friable, Non-plastic | C | SP | 15.9 | <4 | 8 | 4 | <4 | 5 | <20 * | <10 * | Alta |
| RL-256+00-SW275 | 11/4/2006 | 0.0-0.9 | wetland | 10YR 3/2 very dark grayish br loam, few 10YR 4/4 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots | A1 | ML/CL | 36.7 | 17 | 650 | 340 | 290 | 490 | 1800 | 250 | Alta |
| RL-256+00-SW275 | 11/4/2006 | 0.9-1.9 | wetland | 10YR 2/1 black clay loam, few 10YR 4/3 brown mottle, wet, subangular blocky, moist, firm, moderately plastic, very few very fine roots, Borderline loam. Horizon divided for sample analysis. | A2 | CL | 34.2 | <4 | 23 | 11 | 10 | 14 | 58 | 10 | Alta |
| RL-256+00-SW275 | 11/4/2006 | 1.9-2.8 | wetland | 10YR 2/1 black clay loam, few 10YR 4/3 brown mottle, wet, subangular blocky, moist, firm, moderately plastic, very few very fine roots, Borderline loam. Horizon divided for sample analysis. | A2 | CL | 50.4 | <4 | 27 | 7 | 8 | 6 | 48* | <10 * | Alta |
| RL-256+00-SW275 | 11/4/2006 | 2.8-3.8 | wetland | 2.5Y 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, Few layers within horizon have some fines. Horizon divided for sample analysis. | Cg | SP | 22.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-256+00-SW275 | 11/4/2006 | 3.8-4.8 | wetland | 2.5Y 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, Few layers within horizon have some fines. Horizon divided for sample analysis. | Cg | SP | 21.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-258+50-IC-C | 10/8/2006 | 0.0-1.2 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, fine medium sand coarse sand very few shell fragments very few fine gravel subrounded grains somewhat well sorted | 1 | SP | 8.9 | <4 | 14 | 4 | 5 | 12 | 35* | <10 * | Alta |
| RL-258+50-IC-C | 10/8/2006 | 1.2-1.9 | in-channel | 10YR 4/2 dark grayish brown loamy coarse sand, wet, single grain, moist, loose, Non-plastic, loamy medium sand few coarse sand very few shell fragments very few angular glossy black medium and coarse sand | 2 | SM | 15 | <4 | 10 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RL-258+50-IC-C | 10/8/2006 | 1.9-2.3 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine gravel few shell fragments few angular glossy black coarse sand | 3 | SM | 14.9 | <4 | 540 | 180 | 180 | 150 | 1000 | 140 | Alta |
| RL-258+50-IC-NE | 10/8/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, very few medium roots, fine medium sand very few fine gravel very few shell fragments very few angular glossy black sand somewhat well sorted subrounded grains | 1 | SP | 3.3 | <4 | 41 | 7 | 6 | 9 | 63 | 10* | Alta |
| RL-258+50-IC-NE | 10/8/2006 | 0.5-1.6 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic, few coarse roots, medium loamy sand few coarse sand few shell fragments very few angular glossy black sand layer of organic mater at 1.2' | 2 | SM | 35 | <4 | 40 | 17 | 14 | 20 | 91 | 13 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-258+50-IC-SW | 10/8/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, wet, moist, loose, Non-plastic, very few medium roots, very few fine to medium gravel few coarse sand somewhat well sorted | 1 | SP | 2.6 | <4 | 54 | 9 | 10 | 13 | 86 | 13 | Alta |
| RL-258+50-IC-SW | 10/8/2006 | 0.6-1.1 | in-channel | 10YR 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic, noncohesive few medium and coarse sand very few fine gravel very few angular glossy black coarse sand well sorted | 2 | SP | 2.1 | <4 | 18 | 5 | 8 | 10 | 41* | <10* | Alta |
| RL-258+50-IC-SW | 10/8/2006 | 1.1-1.9 | in-channel | 10YR 5/2 grayish brown fine sand, wet, single grain, moist, loose, Non-plastic, fine and medium sand few coarse sand very few fine gravel subrounded very few angular glossy black coarse sand somewhat well sorted | 3 | SP | 5 | <4 | 3000 | 1100 | 1000 | 720 | 5800 | 780 | Alta |
| RL-258+50-IC-SW | 10/8/2006 | 1.9-2.4 | in-channel | 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, few medium roots, medium loamy sand few coarse sand common shell fragments layer of organic material at 2.1 feet | 4 | SM | 15.6 | 20 | 54000 | 43000 | 36000 | 30000 | 160000 | 23000 | Alta |
| RL-258+50-IC-SW | 10/8/2006 | 2.4-3.0 | in-channel | 10YR 4/1 dark gray silt loam, moist, subangular blocky, moist, friable, slightly plastic, common fine roots, roots very fine to medium organic layer at 2.4 feet and at 3.0 feet | 5 | ML | 58.1 | <4 | 220 | 59 | 63 | 44 | 390 | 54 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-258+50-SW125 | 8/9/2006 | 0.0-1.1 | low terrace | 10YR 3/3 dark brown loamy sand, moist, granular, moist, Non-plastic | A | SW | 10.7 | 15 | 2400 | 1200 | 1200 | 1300 | 6200 | 860 | Dow |
| RL-258+50-SW125 | 8/9/2006 | 1.1-1.5 | low terrace | 10YR 4/3 brown sandy loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, few roots, Clay laminate (vertical distribution in macropores). Undecomposed buried vegetation (grass). | Bw | SP | 14.4 | <4 | 160 | 89 | 88 | 92 | 430 | 62 | Dow |
| RL-258+50-SW125 | 8/9/2006 | 1.5-3.7 | low terrace | 10YR 4/3 brown loamy sand, few 10YR 5/4 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, few roots | C | SP | 15.3 | 13 | 4500 | 2300 | 2100 | 1600 | 11000 | 1500 | Dow |
| RL-258+50-SW125 | 8/19/2006 | 3.7-4.2 | low terrace | 10YR 4/3 brown loamy sand, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, few fine roots, Mottles, few, fine. | C | SW | 9 | <4 | 10 | 5 | 5 | 5 | 25* | <10* | Dow |
| RL-258+50-SW125 | 8/19/2006 | 4.2-5.9 | low terrace | 10YR 3/3 dark brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few roots, Mottles, common, medium. | 2Bb | ML/CL | 20.6 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Dow |
| RL-258+50-SW125 | 8/19/2006 | 5.9-6.9 | low terrace | 10YR 5/3 brown loam, common 10YR 5/6 yellowish brown mottle, wet, granular, moist, friable, moderately plastic, few roots, Loam/clay loam. Granular/subangular blocky. Mottles, common, medium. Horizon: 2C1 mixed. | 2C1 | ML/CL | 18.9 | <4 | 32 | 16 | 16 | 18 | 82 | 14 | Dow |
| RL-258+50-SW125 | 8/19/2006 | 6.9-7.5 | low terrace | 2.5Y 4/2 dark grayish brown clay loam, common 10YR 4/6 dark yellowish brown mottle, wet, moist, friable, moderately plastic, few roots, Mottles, common, medium. Clay loam/clay Horizon: 2C2 mixed | 2C2 | ML/CL | 24.8 | <4 | 12 | 6 | 6 | 7 | 32* | <10* | Dow |
| RL-258+50-SW125 | 8/19/2006 | 7.5-8.5 | low terrace | 10YR 3/2 very dark grayish br clay, common 5Y 5/1 gray mottle, wet, moist, friable, moderately plastic, few roots, Clay/clay loam. Subangular blocky/granular. Some gley soil matrix, 5Y 5/1, common, medium. Horizon: 2C3 mixed | 2C3 | CL | 29 | <4 | 10 | 7 | 6 | 6 | 29* | <10* | Dow |
| RL-258+50-SW125 | 9/9/2006 | 8.5-9.5 | low terrace | 10Y 4/1 dark greenish gray clay loam, wet, massive, moist, firm, moderately plastic, Returned to location on Aug. 19, 2006 to go 3.7-8.5' bgs. Returned to location on Sept. 9, 2006 to go 8.5-9.5' bgs. | 2C3 | CL | 22.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-258+50-SW15 | 8/9/2006 | 0.0-1.3 | intermediate terrace | 10YR 2/2 very dark brown loam, moist, granular, moist, very friable, slightly plastic, common fine roots | A1 | -- | 18.5 | 38 | 1300 | 570 | 610 | 700 | 3200 | 480 | Dow |
| RL-258+50-SW15 | 8/9/2006 | 1.3-2.3 | intermediate terrace | 10YR 3/3 dark brown loam, moist, granular, moist, very friable, slightly plastic, fewroots | AC | -- | 8.1 | <4 | 4700 | 2100 | 2500 | 2700 | 12000 | 1700 | Dow |
| RL-258+50-SW15 | 8/9/2006 | 2.3-2.9 | intermediate terrace | 10YR 4/3 brown sandy loam, moist, single grain, moist, very friable, slightly plastic, fewroots, Single grain/granular | C1 | -- | 5.7 | 40 | 34000 | 11000 | 15000 | 12000 | 71000 | 10000 | Dow |
| RL-258+50-SW15 | 8/9/2006 | 2.9-3.4 | intermediate terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, fewroots | C2 | -- | 6.7 | 13 | 16000 | 6600 | 6700 | 5300 | 35000 | 4800 | Dow |
| RL-258+50-SW15 | 8/20/2006 | 3.4-4.4 | intermediate terrace | 10YR 4/3 brown sand, dry, granular, dry, soft, Non-plastic, fewroots, Granular/single grain | C2 | SW | 6.6 | <4 | 280 | 120 | 110 | 93 | 610 | 85 | Dow |
| RL-258+50-SW15 | 8/20/2006 | 4.4-5.4 | intermediate terrace | 10YR 4/3 brown sand, dry, granular, dry, soft, Non-plastic, fewroots, Granular/single grain | C2 | SW | 6.3 | <4 | 1400 | 580 | 580 | 350 | 2900 | 400 | Dow |
| RL-258+50-SW15 | 8/20/2006 | 5.4-6.6 | intermediate terrace | 10YR 6/4 light yellowish brow sand, dry, single grain, dry, soft, Non-plastic, fewroots | C3 | SP | 4.9 | <4 | 54 | 29 | 24 | 23 | 130 | 20 | Dow |
| RL-258+50-SW15 | 8/20/2006 | 6.6-7.6 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, moist, granular, moist, very friable, slightly plastic, fewroots, Ganular/single grain. | 2C4 | SM | 12.9 | <4 | 20 | 7 | 7 | 6 | 39* | <10 * | Dow |
| RL-258+50-SW15 | 8/20/2006 | 7.6-8.4 | intermediate terrace | 10YR 5/4 yellowish brown loam, common 10YR 5/6 yellowish brown mottle, wet, granular, moist, friable, moderately plastic, fewroots, Mottles, common, medium. | 2C5 | SM | 14.3 | <4 | 12 | 4 | 5 | 8 | 28* | <10 * | Dow |
| RL-258+50-SW15 | 9/9/2006 | 8.4-9.6 | intermediate terrace | 10YR 5/3 brown fine sand, wet, single grain, moist, loose, Non-plastic | C2 | SP | 15.1 | <4 | 240 | 70 | 78 | 64 | 450 | 63 | Dow |
| RL-258+50-SW15 | 9/9/2006 | 9.6-10.5 | intermediate terrace | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, Gravelly sand, gravel <5 mm. white shell fragments, 1% volume, <0.5 cm diameter. | C3 | SP | 14.3 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RL-258+50-SW285 | 8/15/2006 | 0.0-0.8 | wetland | 10YR 3/3 dark brown clay loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, very friable, moderately plastic, common fine roots | A1 | ML/CL | 45.1 | 8 | 290 | 130 | 110 | 170 | 700 | 98 | Alta |
| RL-258+50-SW285 | 8/15/2006 | 0.8-3.2 | wetland | 10YR 3/3 dark brown loam, moist, granular, moist, very friable, slightly plastic, Moist to saturated. Saturated at ~2.0'. White snail shells (less than 4 mm diameter), <5%. Shiny black flecks observed near 4.0', <5%. | A2 | SM | 63.3 | <4 | 16 | <8 | <8 | <4 | <28 * | <10 * | Alta |
| RL-258+50-SW285 | 8/15/2006 | 3.2-4.0 | wetland | 10YR 3/3 dark brown loam, moist, granular, moist, very friable, slightly plastic, Moist to saturated. Saturated at ~2.0'. White snail shells (less than 4 mm diameter), <5%. Shiny black flecks observed near 4.0', <5%. | A2 | SM | 61.6 | <4 | 79 | 39 | 33 | 57 | 210 | 29 | Alta |
| RL-258+50-SW285 | 9/9/2006 | 4.0-5.0 | wetland | 10Y 4/1 dark greenish gray clay loam, wet, massive, moist, friable, moderately plastic, Clay loam/clay | C | CL | 28.2 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-258+50-SW435 | 8/15/2006 | 0.0-0.8 | upper high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SM | 11.8 | 7 | 29 | 14 | 15 | 22 | 87 | 19 | Alta |
| RL-258+50-SW435 | 8/15/2006 | 0.8-1.2 | upper high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, common fine roots | C1 | SP | 8.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-258+50-SW435 | 8/15/2006 | 1.2-1.7 | upper high terrace | 10YR 5/8 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, Same as C1 horizon except color change due to iron accumulation. | C2 | SP | 6.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-258+50-SW435 | 8/15/2006 | 1.7-2.4 | upper high terrace | 10YR 5/4 yellowish brown sand, few 10YR 5/6 yellowish brown mottle, moist, single grain, moist, very friable, Non-plastic | C3 | SP | 8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RL-258+50-SW45 | 8/9/2006 | 0.0-1.5 | high terrace | 10YR 3/3 dark brown loamy sand, moist, granular, moist, loose, Non-plastic, common fine roots | A | -- | 6.5 | <4 | 5600 | 2500 | 2500 | 2100 | 13000 | 1700 | Dow |
| RL-258+50-SW45 | 8/9/2006 | 1.5-3.1 | high terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, few roots | C1 | -- | 3.6 | <4 | 160 | 53 | 59 | 37 | 310 | 44 | Dow |
| RL-258+50-SW45 | 8/9/2006 | 3.1-3.7 | high terrace | 10YR 3/3 dark brown clay loam, moist, granular, moist, friable, moderately plastic, few fine roots, Granular/subangular blocky. Buried A horizon. | 2Ab | -- | 10.2 | <4 | 60 | 30 | 30 | 25 | 140 | 22 | Dow |
| RL-258+50-SW45 | 8/9/2006 | 3.7-4.4 | high terrace | 10YR 4/3 brown sand, moist, single grain, moist, loose, Non-plastic, few roots | 2C2 | -- | 7.7 | <4 | 6 | 4 | 4 | 4 | <20 * | <10 * | Dow |
| RL-258+50-SW45 | 9/9/2006 | 4.4-5.4 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, moist, single grain, moist, very friable, slightly plastic, Single grain/granular. Layer of sand, poorly graded sand (SP) at ~5.4', is 0.3' thick. | 2C2 | SW | 4.5 | <4 | 43 | 22 | 21 | 18 | 100 | 17 | Dow |
| RL-258+50-SW45 | 9/9/2006 | 5.4-6.4 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, moist, single grain, moist, very friable, slightly plastic, Single grain/granular. Layer of sand, poorly graded sand (SP) at ~5.4', is 0.3' thick. | 2C2 | SW | 4.7 | <4 | 77 | 39 | 37 | 33 | 190 | 28 | Dow |
| RL-258+50-SW45 | 9/9/2006 | 6.4-7.4 | high terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic | 22 | SP | 5.4 | <4 | 84 | 41 | 40 | 35 | 200 | 29 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|---|----------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-258+55-SW15 | 10/22/2006 | 0.0-1.3 | intermediate terrace | | -- | -- | 25.2 | 50 | 1400 | 510 | 610 | 960 | 3500 | 530 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 1.3-2.3 | intermediate terrace | | -- | -- | 12.9 | 14 | 2300 | 1200 | 1500 | 3200 | 8100 | 1100 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 2.3-2.9 | intermediate terrace | | -- | -- | 8.9 | 6 | 3900 | 2100 | 1700 | 2400 | 10000 | 1300 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 2.9-3.4 | intermediate terrace | | -- | -- | 5 | 9 | 36000 | 18000 | 15000 | 13000 | 82000 | 11000 | Alta |
| RL-258+55-SW15 | 10/22/2006 | 2.9-3.4 Lab Duplicate | intermediate terrace | | -- | -- | 5 | 10 | 45000 | 19000 | 16000 | 13000 | 93000 | 12000 | Alta |
| RL-258+55-SW15 | 10/22/2006 | 5.4-6.6 | intermediate terrace | | -- | -- | 5.6 | <4 | 370 | 150 | 150 | 140 | 810 | 110 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 6.6-7.6 | intermediate terrace | | -- | -- | 19.4 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 7.6-8.4 | intermediate terrace | | -- | -- | 8.3 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 8.4-9.6 | intermediate terrace | | -- | -- | 19.3 | <4 | 20 | 11 | 10 | 9 | 50 | <10 [*] | Dow |
| RL-258+55-SW15 | 10/22/2006 | 9.6-10.5 | intermediate terrace | | -- | -- | 12.1 | <4 | 6 | <4 | <4 | <8 ^{LISR} | <24 [*] | <10 [*] | Dow |
| RL-258+55-SW15 | 10/22/2006 | 10.5-13.0 | intermediate terrace | | -- | -- | 14.5 | <4 | 5 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RL-258+55-SW15 | 10/22/2006 | 13.0-15.6 Field Duplicate Lab Duplicate | intermediate terrace | | -- | -- | 13.2 | <4 | 29 | 8 | 6 | 4 | 47 [*] | <10 [*] | Dow |
| RL-258+55-SW15 | 10/22/2006 | 13.0-15.6 Field Duplicate | intermediate terrace | | -- | -- | 13.3 | <4 | <4 | <5 ^{LISR} | <6 ^{LISR} | <12 ^{LISR} | <31 | <10 | Dow |
| RL-258+55-SW15 | 10/22/2006 | 13.0-15.6 | intermediate terrace | | -- | -- | 14.3 | <4 | 9 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RL-258+55-SW15 | 10/22/2006 | 15.6-16.0 | intermediate terrace | | -- | -- | 17.7 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach L

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RL-260+50-T-SW320 | 8/15/2006 | 0.0-1.1 | tributary | 10YR 3/1 very dark gray loam, many 5YR 4/6 yellowish red mottle, subangular blocky, moist, friable, moderately plastic, Many, fine, distinct mottles. Organic detritus throughout. | 1 | -- | 52.3 | 22 | 240 | 120 | 110 | 170 | 650 | 110 | Alta |
| RL-260+50-T-SW320 | 8/15/2006 | 1.1-2.2 Lab Duplicate | tributary | 10YR 3/1 very dark gray loam, many 5YR 4/6 yellowish red mottle, subangular blocky, friable, moderately plastic, Many, fine, distinct mottles. Organic detritus throughout. | 2 | -- | 32.6 | 10 | 490 | 210 | 380 | 240 | 1300 | 220 | Dow |
| RL-260+50-T-SW320 | 8/15/2006 | 1.1-2.2 | tributary | 10YR 3/1 very dark gray loam, many 5YR 4/6 yellowish red mottle, subangular blocky, friable, moderately plastic, Many, fine, distinct mottles. Organic detritus throughout. | 2 | -- | 32.4 | 11 | 600 | 290 | 300 | 380 | 1600 | 230 | Dow |
| RL-260+50-T-SW320 | 9/10/2006 | 2.2-2.8 | tributary | 10YR 3/1 very dark gray loam, common 7.5YR 5/8 strong brown mottle, moist, granular, moist, friable, moderately plastic, Loam/sandy loam. Granular/subangular blocky. Mottles, common, fine to medium. | C2 | SM | 25.7 | <4 | 410 | 200 | 200 | 240 | 1000 | 150 | Dow |
| RL-260+50-T-SW320 | 9/10/2006 | 2.2-2.8 Lab Duplicate | tributary | 10YR 3/1 very dark gray loam, common 7.5YR 5/8 strong brown mottle, moist, granular, moist, friable, moderately plastic, Loam/sandy loam. Granular/subangular blocky. Mottles, common, fine to medium. | C2 | SM | 22.4 | <4 | 500 | 230 | 230 | 240 | 1200 | 170 | Dow |
| RL-260+50-T-SW320 | 9/10/2006 | 2.8-4.5 | tributary | 10YR 4/2 dark grayish brown clay loam, wet, moist, friable, moderately plastic, Clay loam/clay. Wet at ~2.8' bgs. | C3 | CL | 17 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-260+50-T-SW70 | 8/15/2006 | 0.0-1.1 | tributary | 10YR 3/3 dark brown fine sandy loam, common mottle, subangular blocky, slightly plastic, Common, medium, distinct mottles | 1 | -- | 17.8 | 57 | 450 | 220 | 210 | 460 | 1400 | 240 | Alta |
| RL-260+50-T-SW70 | 8/15/2006 | 1.1-2.2 | tributary | 10YR 3/3 dark brown sandy loam, common 10YR 4/6 dark yellowish brown mottle, subangular blocky, slightly plastic, Organic detritus throughout (1.1-2.2'). | 23 | -- | 13.6 | 14 | 1700 | 760 | 860 | 930 | 4200 | 610 | Dow |
| RL-260+50-T-SW70 | 9/10/2006 | 2.2-2.8 | tributary | 10YR 3/3 dark brown sandy loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, very friable, slightly plastic, Mottles, few, fine to medium | 2C2 | SM | 4.7 | 5 | 68 | 18 | 25 | 22 | 140 | 24 | Dow |
| RL-260+50-T-SW70 | 9/10/2006 | 2.8-3.4 | tributary | 10YR 5/3 brown coarse sand, dry, single grain, dry, loose, Non-plastic | 2C3 | SP | 4.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RL-260+50-T-SW70 | 9/10/2006 | 3.4-4.2 | tributary | 10YR 5/3 brown coarse sand, dry, single grain, dry, loose, Non-plastic | 2C3 | SP | 4.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-262+00-IC-C | 10/9/2006 | 0.0-0.7 | in-channel | 10YR 5/2 grayish brown fine sand, single grain, moist, loose, Non-plastic, very few fine roots, fine and medium sand very few coarse sand very few shell fragments subrounded grains somewhat well sorted | 1 | SP | 2.7 | <4 | 33 | 12 | 12 | 12 | 69 | 12 | Dow |
| RM-262+00-IC-C | 10/9/2006 | 0.0-0.7 Lab Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, single grain, moist, loose, Non-plastic, very few fine roots, fine and medium sand very few coarse sand very few shell fragments subrounded grains somewhat well sorted | 1 | SP | 2.4 | <4 | 15 | 4 | 5 | 8 | 33* | <10 * | Dow |
| RM-262+00-IC-C | 10/9/2006 | 0.7-1.2 | in-channel | 10YR 4/2 dark grayish brown coarse sand, moist, single grain, moist, loose, Non-plastic, medium and coarse sand few shell fragments shell fragment layers at 0.8' and 1.2' very few fine gravel somewhat well sorted subrounded grains | 2 | SP | 6.8 | 20 | 27000 | 12000 | 12000 | 9100 | 60000 | 8300 | Dow |
| RM-262+00-IC-C | 10/9/2006 | 1.2-1.8 | in-channel | 10YR 4/1 dark gray loamy sand, wet, single grain, moist, loose, Non-plastic, medium loamy sand few coarse sand few shell fragments shell layer at 1.6 feet subrounded grains | 3 | SM | 19.7 | 15 | 13000 | 2300 | 3400 | 1300 | 20000 | 2800 | Dow |
| RM-262+00-IC-NE | 10/8/2006 | 0.0-1.0 | in-channel | 10YR 4/2 dark grayish brown sand, moist, single grain, moist, loose, Non-plastic, few fine gravel common shell fragments subrounded and subangular grains very few angular glassy black sand | 1 | SM | 9.9 | <4 | 64 | 7 | 8 | 8 | 87 | 13 | Alta |
| RM-262+00-IC-SW | 10/9/2006 | 0.0-1.3 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, few coarse sand subrounded grains well sorted | 1 | SP | 2.3 | <4 | 12 | 4 | 5 | 6 | 27 | <10 | Dow |
| RM-262+00-IC-SW | 10/9/2006 | 1.3-2.2 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand very few coarse sand subrounded grains well sorted | 2 | SP | 2.9 | <4 | 24 | 6 | 7 | 12 | 49* | <10 * | Dow |
| RM-262+00-IC-SW | 10/9/2006 | 2.2-2.6 | in-channel | 10YR 4/2 dark grayish brown sand, wet, single grain, moist, loose, Non-plastic, medium sand few coarse sand very few fine gravel very few shell fragments very few angular glossy black coarse sand subrounded grains somewhat well sorted | 3 | SP | 10.3 | <4 | 29 | 6 | 8 | 7 | 50* | <10 * | Dow |
| RM-262+00-IC-SW | 10/9/2006 | 2.6-2.9 | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand very few coarse sand very few fine gravel very few shell fragments very few angular glossy black coarse sand subrounded grains | 4 | SM | 14.1 | <4 | 16 | 4 | 5 | 6 | 32* | <10 * | Dow |
| RM-262+00-IC-SW | 10/9/2006 | 2.9-3.3 | in-channel | 10YR 3/1 very dark gray sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, few fine gravel very few shell fragments subrounded grains very few angular glossy black sand | 5 | SM | 13.3 | 4 | 2700 | 1300 | 1100 | 860 | 5900 | 780 | Dow |
| RM-262+00-NE1035 | 10/18/2006 | 0.0-1.5 | high terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown sandy clay loam, moist, granular, weak, moist, friable, moderately plastic | A | CL | 18.5 | <4 | 120 | 61 | 49 | 63 | 300 | 39 | Alta |
| RM-262+00-NE1035 | 10/18/2006 | 1.5-2.6 | high terrace | 10YR 4/1 dark gray sandy clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, moderately plastic | AC | CL | 17.5 | <4 | 5 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RM-262+00-NE1035 | 10/18/2006 | 2.6-3.3 | high terrace | 2.5Y 5/2 grayish brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, friable, slightly plastic | C | CL | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-262+00-NE1135 | 10/18/2006 | 0.0-1.1 | upper high terrace | 10YR 2/1 black loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | A | SP | 12.3 | <4 | 25 | 12 | 13 | 21 | 71 | 10 | Alta |
| RM-262+00-NE1135 | 10/18/2006 | 1.1-1.9 | upper high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 8.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE1135 | 10/18/2006 | 1.9-2.7 | upper high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 10.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE1135 | 10/18/2006 | 2.7-3.3 | upper high terrace | 10YR 5/1 gray sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, subangular blocky, weak, moist, firm, moderately plastic | C | CL | 11.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE15 | 8/16/2006 | 0.0-0.6 | low terrace | 10YR 4/2 dark grayish brown loamy sand, dry, granular, dry, loose, Non-plastic, common very fine roots, loose, with very fine, fine and medium roots | A3 | SM | 9.8 | <4 | 290 | 81 | 89 | 86 | 540 | 75 | Dow |
| RM-262+00-NE15 | 8/16/2006 | 0.6-0.8 | low terrace | 10YR 5/4 yellowish brown sandy loam, dry, subangular blocky, dry, slightly plastic, few fine roots, very friable | Bw3 | SM | 8.9 | <4 | 46 | 38 | 32 | 45 | 160 | 24 | Dow |
| RM-262+00-NE15 | 8/16/2006 | 0.8-2.3 | low terrace | 10YR 5/3 brown sandy loam, common mottle, dry, subangular blocky, dry, slightly plastic, Common medium distinct mottles, very friable | C1 | SM | 9.5 | <4 | <6 | <11 | <13 | 5 | <38 * | <10 * | Dow |
| RM-262+00-NE15 | 8/16/2006 | 2.3-4.3 | low terrace | 10YR 5/4 yellowish brown sandy loam, common mottle, moist, subangular blocky, moist, very friable, slightly plastic, very friable, common medium distinct mottles | C2 | SM | 17.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE15 | 9/10/2006 | 4.3-5.4 | low terrace | 10YR 5/4 yellowish brown sandy clay loam, few 5YR 4/6 yellowish red mottle, wet, subangular blocky, moderately plastic, Saturated at 5 feet | C2 | CL | 17.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE255 | 8/16/2006 | 0.0-1.4 | high terrace | 10YR 3/2 very dark grayish br sandy loam, dry, subangular blocky, dry, slightly plastic, common very fine roots, very friable | A8 | SM | 8.7 | 4 | 3100 | 1000 | 1100 | 810 | 5900 | 820 | Dow |
| RM-262+00-NE255 | 8/16/2006 | 1.4-2.5 | high terrace | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly plastic, very friable | Bw8 | SM | 8.6 | <4 | 83 | 35 | 31 | 36 | 190 | 27 | Alta |
| RM-262+00-NE255 | 8/16/2006 | 2.5-3.2 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, loose | C1 | SW | 11.1 | <4 | 33 | 15 | 16 | 15 | 79 | 13 | Dow |
| RM-262+00-NE255 | 8/16/2006 | 3.2-3.8 | high terrace | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, single grain, moist, Non-plastic, 2 - 5% gravel | C2 | SM | 18.2 | <4 | 540 | 120 | 170 | 86 | 910 | 130 | Dow |
| RM-262+00-NE255 | 9/10/2006 | 3.8-4.9 | high terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moderately plastic, Gravel approx. 20-30% volume - vary from 1mm to > 2cm, refusal after 1st sample. | C2 | CL | 9.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|---------------------------------|-------------------------|---|--|---------------------------|------------|
| RM-262+00-NE40 | 8/16/2006 | 0.0-2.1 | high terrace | 10YR 4/3 brown loamy fine sand, dry, granular, dry, loose, slightly plastic, common fine roots, loose, soft, Fill sand and gravel, silt sand | 2 | SM | 1.9 | 7 | 650 | 290 | 320 | 410 | 1700 | 240 | Dow |
| RM-262+00-NE40 | 8/16/2006 | 2.1-2.3 | high terrace | 10YR 4/4 dark yellowish brown sand, dry, subangular blocky, dry, loose, Non-plastic, loose, well graded sand | C1 | SW | 6.6 | <4 | 330 | 75 | 110 | 78 | 590 | 86 | Dow |
| RM-262+00-NE40 | 8/16/2006 | 2.3-3.5 | high terrace | 10YR 3/4 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, slightly hard, silty sand | C2 | SM | 8.2 | <4 | 67 | 17 | 22 | 25 | 130 | 20 | Alta |
| RM-262+00-NE40 | 8/16/2006 | 3.5-4.3 | high terrace | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic, firm, freshwater snail shell | C3 | SM | 16.8 | <4 | <5 | <11 | <4 | 6 | <28 * | <10 * | Dow |
| RM-262+00-NE40 | 9/10/2006 | 4.3-5.6 | high terrace | 10YR 4/3 brown sandy clay loam, common 5YR 5/6 yellowish red mottle, moist, subangular blocky, moderately plastic, Sand layers 4.5 to 4.8 ft and 7.8-7.9 ft poorly graded. White shells at about 5.4 to 5.6 ft, few, diameter < 0.5cm | C3 | CL | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE40 | 9/10/2006 | 5.6-6.8 | high terrace | 10YR 4/3 brown sandy clay loam, common 5YR 5/6 yellowish red mottle, moist, subangular blocky, moderately plastic, Sand layers 4.5 to 4.8 ft and 7.8-7.9 ft poorly graded. White shells at about 5.4 to 5.6 ft, few, diameter < 0.5cm | C3 | CL | 17.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE40 | 9/10/2006 | 6.8-8.0 | high terrace | 10YR 4/3 brown sandy clay loam, common 5YR 5/6 yellowish red mottle, moist, subangular blocky, moderately plastic, Sand layers 4.5 to 4.8 ft and 7.8-7.9 ft poorly graded. White shells at about 5.4 to 5.6 ft, few, diameter < 0.5cm | C3 | CL | 17.4 | <4 | 50 | 61 | 36 | 52 | 200 | 27 | Alta |
| RM-262+00-NE5 | 8/16/2006 | 0.0-0.2 | floodplain | 10YR 3/1 very dark gray sandy loam, moist, angular blocky, moist, friable, moderately plastic, many fine roots, Sandy loam and sand, friable | A2 | SM | 26.8 | <6 | 200 | 80 | 85 | 100 | 470 | 68 | Dow |
| RM-262+00-NE5 | 8/16/2006 | 0.2-0.6 | floodplain | 10YR 6/4 light yellowish brow sand, moist, subangular blocky, moist, loose, Non-plastic, common very fine roots, loose | C2 | SM | 6.3 | <8 | 84 | 34 | 36 | 44 | 200 | 30 | Dow |
| RM-262+00-NE5 | 8/16/2006 | 0.6-1.2 | floodplain | 10YR 3/2 very dark grayish br sandy loam, moist, subangular blocky, moderately plastic, common very fine roots | Ab2 | SM | 25.3 | <4 | 400 | 380 | 250 | 340 | 1400 | 180 | Dow |
| RM-262+00-NE5 | 8/16/2006 | 1.2-2.3 | floodplain | 10YR 5/4 yellowish brown loamy sand, common mottle, subangular blocky, slightly plastic, very few very fine roots, Common distinct mottles, friable Horizon listed as Bwb | Bw2 | SC | 16.9 | <5 | 7 | <16 ^{LIS} _R | <4 | 6 | <33 * | <10 * | Dow |
| RM-262+00-NE5 | 8/16/2006 | 2.3-3.4 | floodplain | N 6/0 gray sand, single grain, Non-plastic, few medium roots, interbedded sand and sandy clay loam, SW and CL, single grained (sand) and Subangular blocky (sandy clay loam), non-plastic (sand) and moderately plastic (sandy clay loam), loose (sand) and friable (sandy clay loam) | Cg2 | SW | 14.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-262+00-NE585 | 10/18/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots, A horizon is a plow horizon. | A | SM | 15.8 | 6 | 440 | 230 | 180 | 250 | 1100 | 150 | Alta |
| RM-262+00-NE585 | 10/18/2006 | 0.8-1.5 | high terrace | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | E | SP | 12.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE585 | 10/18/2006 | 1.5-3.1 | high terrace | 10YR 4/6 dark yellowish brown and 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 12.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-262+00-NE585 | 10/18/2006 | 3.1-3.6 | high terrace | 10YR 4/4 dark yellowish brown fine sandy loam, 15<35% gravel, wet, moist, friable, slightly plastic, Texture ranges from fine sand to sandy clay loam. | C | SC | 15.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 0.0-1.4 | high terrace | 10YR 6/3 pale brown and 10YR 3/2 very dark grayish br fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few very fine roots, Fine gravel within 0.3' of the surface (likely fill gravel). Alternating layers of 10YR 6/3 fine sand and 10YR 3/2 fine sand. Topsoil too thin to be considered an A horizon. | C1 | SP | 5.8 | 13 | 30000 | 7100 | 8800 | 4400 | 51000 | 7000 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 1.4-3.1 | high terrace | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, Mostly 10YR 3/3 very fine sand, but a few thin layers of 10YR 4/4 v. sand mixed in. | C2 | SP | 9.5 | <4 | 340 | 150 | 140 | 120 | 750 | 100 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 3.1-4.2 | high terrace | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C3 | SP | 12.9 | <4 | 18 | 11 | 8 | 9 | 46* | <10* | Alta |
| RM-265+00-NE40 | 11/4/2006 | 4.2-5.3 | high terrace | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C3 | SP | 10.1 | <4 | 79 | 48 | 35 | 42 | 200 | 29 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 5.3-6.8 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, 10YR 4/4 fine sand from 5.5 - 5.8'. | C4 | SP | 5.6 | <4 | 120 | 62 | 47 | 56 | 280 | 39 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 6.8-7.4 | high terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic, Layer of 10YR 5/4 fine sand from 7.1 - 7.2'. | C5 | CL | 14.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-265+00-NE40 | 11/4/2006 | 7.4-7.7 | high terrace | 10YR 4/2 dark grayish brown loamy fine sand, few 10YR 4/4 dark yellowish brown mottle, moist, structureless, moist, very friable, Non-plastic | C6 | SP | 13.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-IC-C | 10/9/2006 | 0.0-0.2 | in-channel | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, common fine roots, subrounded grains well sorted | 1 | SP | 8 | <4 | 240 | 73 | 76 | 44 | 440 | 61 | Dow |
| RM-268+00-IC-C | 10/9/2006 | 0.2-0.6 | in-channel | 10YR 4/1 dark gray fine sand, moist, single grain, moist, loose, Non-plastic, fine to medium sand very few shell fragments very few black angular glossy coarse sand subrounded grains somewhat well sorted | 2 | SP | 8.8 | <4 | 63 | 19 | 19 | 26 | 130 | 19 | Dow |
| RM-268+00-IC-C | 10/9/2006 | 0.6-1.0 | in-channel | 10YR 2/1 black, many coarse roots, roots/black material (wood) | 3 | -- | 40.8 | 18 | 8200 | 600 | 1500 | 630 | 11000 | 1500 | Dow |
| RM-268+00-IC-C | 10/9/2006 | 1.0-1.4 | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, few medium roots, medium loamy sand few coarse sand few shell fragments very few fine gravel very few angular glossy black coarse sand subrounded grains Layer of wood at 1.3' | 4 | SM | 19.1 | <4 | 85 | 20 | 25 | 21 | 150 | 23 | Dow |
| RM-268+00-IC-NE | 10/9/2006 | 0.0-1.4 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, very few fine and medium roots fine and medium sand very few fine gravel very few shell fragments subrounded grains very few angular glossy black coarse sand well sorted duplicated sample collected | 1 | SP | 2.8 | <4 | 13 | <4 | 5 | 6 | 23* | <10* | Dow |
| RM-268+00-IC-NE | 10/9/2006 | 0.0-1.4 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, very few fine and medium roots fine and medium sand very few fine gravel very few shell fragments subrounded grains very few angular glossy black coarse sand well sorted duplicated sample collected | 1 | SP | 3 | <4 | 15 | <4 | 4 | 4 | 24* | <10* | Dow |
| RM-268+00-IC-NE | 10/9/2006 | 1.4-2.4 Field Duplicate | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand common coarse sand very few fine gravel very few shell fragments subrounded grains very few angular glossy black coarse sand Duplicate sample collected | 2 | SM | 11.9 | <4 | 34 | 7 | 8 | 14 | 62 | 10 | Dow |
| RM-268+00-IC-NE | 10/9/2006 | 1.4-2.4 | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand common coarse sand very few fine gravel very few shell fragments subrounded grains very few angular glossy black coarse sand Duplicate sample collected | 2 | SM | 12.4 | <4 | 47 | 9 | 12 | 13 | 82 | 13 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-IC-SW | 10/9/2006 | 0.0-0.5 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few coarse sand very few fine gravel very few shell fragments few few angular glossy black coarse sand well sorted subrounded grains | 1 | SP | 4.9 | <4 | 20 | 4 | 5 | 7 | 36* | <10 [*] | Dow |
| RM-268+00-IC-SW | 10/9/2006 | 0.0-0.5 Lab Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few coarse sand very few fine gravel very few shell fragments few few angular glossy black coarse sand well sorted subrounded grains | 1 | SP | 5 | <4 | 15 | 4 | 6 | 11 | 35* | <10 [*] | Dow |
| RM-268+00-IC-SW | 10/9/2006 | 0.5-1.0 | in-channel | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand few coarse sand very few fine gravel very few shell fragments very few angular glossy black coarse sand subrounded grains somewhat well sorted | 2 | SP | 9.9 | <4 | 420 | 200 | 170 | 130 | 920 | 130 | Dow |
| RM-268+00-IC-SW | 10/9/2006 | 1.0-1.5 | in-channel | 10YR 4/2 dark grayish brown sand, moist, single grain, moist, loose, Non-plastic, very few fine gravel very few shell fragments very few angular glossy black coarse sand subangular and subrounded grains | 1 | SM | 8.6 | <4 | 24 | 5 | 6 | 8 | 43* | <10 [*] | Dow |
| RM-268+00-IC-SW | 10/9/2006 | 1.5-1.6 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few fine gravel very few shell fragments subrounded grains | 4 | SM | 15 | <4 | 15 | 5 | 10 | 23 | 53 | 10 | Dow |
| RM-268+00-NE190 | 8/17/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, many very fine roots, very fine and fine roots | A | SW | 14 | 24 | 3700 | 1900 | 1800 | 2400 | 9700 | 1300 | Dow |
| RM-268+00-NE190 | 8/17/2006 | 0.3-1.1 | low terrace | 10YR 4/4 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | Bw | SW | 11.4 | 25 | 14000 | 5900 | 4100 | 5800 | 30000 | 3800 | Alta |
| RM-268+00-NE190 | 8/17/2006 | 1.1-2.2 | low terrace | 2.5YR 5/3 reddish brown sand, common 10YR 5/8 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few coarse roots | C1 | SW | 7.4 | 25 | 77000 | 35000 | 31000 | 24000 | 170000 | 22000 | Alta |
| RM-268+00-NE190 | 8/17/2006 | 2.2-3.3 | low terrace | 2.5YR 5/3 reddish brown sand, common 10YR 3/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few coarse roots | C2 | SW | 8.4 | 7 | 5800 | 2700 | 2400 | 2100 | 13000 | 1800 | Dow |
| RM-268+00-NE190 | 9/10/2006 | 3.3-4.7 | low terrace | 10YR 3/2 very dark grayish br sandy loam, few 7.5YR 5/2 brown mottle, moist, granular, moist, firm, moderately plastic, sandy loam/clay loam/silty sand (SM) | C3 | SM | 14.9 | <4 | 3900 | 1100 | 1000 | 900 | 6900 | 900 | Alta |
| RM-268+00-NE190 | 9/10/2006 | 4.7-5.4 | low terrace | 2.5Y 4/3 olive brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, mottles fine to moderate | C4 | ML/CL | 17.4 | <4 | 24 | 10 | 10 | 12 | 56 | <10 [*] | Alta |
| RM-268+00-NE190 | 9/10/2006 | 5.4-6.4 | low terrace | 2.5Y 4/3 olive brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, mottles fine to moderate | C4 | ML/CL | 16 | <4 | 1000 | 520 | 470 | 440 | 2500 | 330 | Alta |
| RM-268+00-NE190 | 9/10/2006 | 6.4-7.6 | low terrace | 2.5Y 4/3 olive brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, mottles fine to moderate | C4 | ML/CL | 16.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| | | | | | | | | | | | | | | | |
| RM-268+00-NE20 | 8/17/2006 | 0.0-0.4 | high terrace | 2.5Y 6/4 light yellowish brow sand, dry, single grain, dry, loose, Non-plastic, common very fine roots, Recent flood deposition common very fine, fine and medium roots | -- | SW | 3.1 | <4 | 290 | 170 | 130 | 180 | 760 | 100 | Alta |
| RM-268+00-NE20 | 8/17/2006 | 0.4-1.6 | high terrace | 2.5Y 5/3 light olive brown fine sand, dry, single grain, dry, loose, Non-plastic, common fine roots | C1 | SW | 3.4 | 5 | 170 | 73 | 93 | 460 | 800 | 110 | Dow |
| RM-268+00-NE20 | 8/17/2006 | 1.6-3.5 | high terrace | 2.5Y 4/3 olive brown fine sand, moist, single grain, moist, loose, Non-plastic, many coarse roots | C2 | SW | 3.6 | 240 | 3800 | 1500 | 1400 | 1600 | 8500 | 1400 | Alta |
| RM-268+00-NE20 | 8/17/2006 | 3.5-4.6 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, common medium roots | C3 | SW | 3.4 | 12 | 8400 | 3100 | 3300 | 2900 | 18000 | 2400 | Dow |
| RM-268+00-NE20 | 8/17/2006 | 4.6-5.5 | high terrace | 5YR 5/4 reddish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, few medium roots | C4 | SW | 8.6 | <4 | 4400 | 2200 | 2000 | 1600 | 10000 | 1400 | Dow |
| RM-268+00-NE20 | 9/10/2006 | 5.5-6.5 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Layers of 10YR 5/4 yellowish brown sand, poorly graded sand (SP) (5.5-5.9 ft & 6.3-6.8 ft & 7.5-7.7 ft), single grain, non-plastic, loose, plant fragments throughout all samples, few."**** | C5 | ML/CL | 4.8 | <4 | 76 | 31 | 27 | 35 | 170 | 24 | Alta |
| RM-268+00-NE20 | 9/10/2006 | 6.5-7.5 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Layers of 10YR 5/4 yellowish brown sand, poorly graded sand (SP) (5.5-5.9 ft & 6.3-6.8 ft & 7.5-7.7 ft), single grain, non-plastic, loose, plant fragments throughout all samples, few."**** | C5 | ML/CL | 12.7 | <4 | 83 | 41 | 32 | 49 | 210 | 29 | Alta |
| RM-268+00-NE20 | 9/10/2006 | 7.5-8.5 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Layers of 10YR 5/4 yellowish brown sand, poorly graded sand (SP) (5.5-5.9 ft & 6.3-6.8 ft & 7.5-7.7 ft), single grain, non-plastic, loose, plant fragments throughout all samples, few."**** | C5 | ML/CL | 9.8 | <4 | 40 | 24 | 17 | 27 | 110 | 15 | Alta |
| RM-268+00-NE20 | 9/10/2006 | 8.5-9.5 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Layers of 10YR 5/4 yellowish brown sand, poorly graded sand (SP) (5.5-5.9 ft & 6.3-6.8 ft & 7.5-7.7 ft), single grain, non-plastic, loose, plant fragments throughout all samples, few."**** | C5 | ML/CL | 7.6 | <4 | 380 | 58 | 71 | 56 | 570 | 75 | Alta |
| RM-268+00-NE20 | 9/10/2006 | 9.5-10.5 | high terrace | 7.5YR 4/4 brown and 10YR 5/4 yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Layers of 10YR 5/4 yellowish brown sand, poorly graded sand (SP) (5.5-5.9 ft & 6.3-6.8 ft & 7.5-7.7 ft), single grain, non-plastic, loose, plant fragments throughout all samples, few."**** | C5 | ML/CL | 15.9 | <4 | 120 | 58 | 49 | 55 | 290 | 39 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-NE250 | 8/17/2006 | 0.0-0.4 | wetland | 10YR 2/1 black sandy loam, moist, subangular blocky, moist, friable, slightly plastic, common very fine roots | A | SC | 28.8 | 16 | 2800 | 1300 | 1300 | 1600 | 7000 | 970 | Dow |
| RM-268+00-NE250 | 8/17/2006 | 0.4-1.8 | wetland | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown sand, few mottle, moist, single grain, moist, loose, slightly plastic, common medium roots, single grained (sand), slightly plastic (sandy loam), loose (sand), friable (sandy loam) - few medium distinct mottles | C1 | SW-SC | 14 | 7 | 13000 | 5400 | 4100 | 4600 | 27000 | 3500 | Alta |
| RM-268+00-NE250 | 8/17/2006 | 1.8-2.3 | wetland | 2.5Y 4/1 dark gray sandy clay loam, common 2.5YR 3/6 dark red mottle, moist, subangular blocky, moist, firm, moderately plastic | C2 | CL | 19.7 | <4 | 91 | 25 | 24 | 16 | 160 | 21 | Alta |
| RM-268+00-NE250 | 8/17/2006 | 2.3-2.7 | wetland | 10YR 2/1 black sandy loam, moist, granular, moist, very friable, slightly plastic, many fine roots, many fine and very fine roots and other organic material | Ab | SC | 36 | 6 | 1500 | 650 | 650 | 620 | 3400 | 480 | Dow |
| RM-268+00-NE250 | 8/17/2006 | 2.3-2.7 Lab Duplicate | wetland | 10YR 2/1 black sandy loam, moist, granular, moist, very friable, slightly plastic, many fine roots, many fine and very fine roots and other organic material | Ab | SC | 35.4 | 5 | 1500 | 670 | 670 | 660 | 3500 | 480 | Dow |
| RM-268+00-NE250 | 8/17/2006 | 2.7-3.3 | wetland | 2.5Y 4/1 dark gray sandy clay loam, common 2.5YR 3/6 dark red mottle, moist, subangular blocky, moist, firm, moderately plastic | C | CL | 27.9 | <4 | 40 | 30 | 30 | 25 | 120 | 20 | Dow |
| RM-268+00-NE250 | 9/11/2006 | 3.3-4.9 | wetland | 10YR 4/1 dark gray clay, common 2.5YR 3/6 dark red mottle, moist, subangular blocky, moist, firm, moderately plastic | 2B1 | CL | 23.7 | <4 | 14 | 5 | 6 | 5 | 30* | <10* | Alta |
| RM-268+00-NE250 | 9/11/2006 | 4.9-5.5 | wetland | 10YR 5/1 gray, common 5YR 4/6 yellowish red mottle, moist, granular, moist, firm, wet at 6" water at 6" mottles few to common gravel <1% | 21 | CL | 20.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-268+00-NE250 | 9/11/2006 | 5.5-6.4 | wetland | 10YR 5/1 gray, common 5YR 4/6 yellowish red mottle, moist, granular, moist, firm, wet at 6" water at 6" mottles few to common gravel <1% | 21 | CL | 22.8 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Alta |
| RM-268+00-NE250 | 9/11/2006 | 6.4-7.4 | wetland | 10YR 5/1 gray, common 5YR 4/6 yellowish red mottle, moist, granular, moist, firm, wet at 6" water at 6" mottles few to common gravel <1% | 21 | CL | 17.3 | <4 | 13 | 8 | 5 | 5 | 31* | <10* | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-NE320 | 8/18/2006 | 0.0-0.5 | low terrace | 10YR 3/1 very dark gray loamy fine sand, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SP | 16.6 | 45 | 6700 | 2300 | 2100 | 2500 | 14000 | 1800 | Alta |
| RM-268+00-NE320 | 8/18/2006 | 0.5-1.0 | low terrace | 10YR 4/3 brown loamy fine sand, few mottle, moist, single grain, moist, friable, slightly plastic, Few medium faint mottles | Bw | SP | 11.1 | 26 | 24000 | 9400 | 7100 | 7900 | 49000 | 6200 | Alta |
| RM-268+00-NE320 | 8/18/2006 | 1.0-1.9 | low terrace | 2.5Y 6/3 light yellowish brow fine sand, few mottle, moist, single grain, moist, loose, Non-plastic, few medium faint mottles | C1 | SP | 16.4 | <4 | 11000 | 3800 | 3500 | 2800 | 21000 | 2800 | Alta |
| RM-268+00-NE320 | 8/18/2006 | 1.9-3.3 | low terrace | 2.5Y 3/2 very dark grayish br loam, common mottle, moist, subangular blocky, moist, friable, moderately plastic, common medium distinct mottles | 2C2 | SC | 18.9 | <4 | 430 | 160 | 150 | 120 | 860 | 120 | Alta |
| RM-268+00-NE320 | 8/18/2006 | 3.3-4.5 | low terrace | 2.5Y 4/2 dark grayish brown clay loam, common mottle, moist, subangular blocky, moist, firm, moderately plastic, common coarse distinct mottles moderate to very plastic | 2C3 | CL | 19.1 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-268+00-NE320 | 9/11/2006 | 4.5-5.6 | low terrace | 10YR 4/2 dark grayish brown clay loam, wet, subangular blocky, moist, firm, moderately plastic, saturated | 2C4 | CL | 19.9 | <4 | 60 | 23 | 18 | 19 | 120 | 17 | Alta |
| RM-268+00-NE320 | 9/11/2006 | 5.6-6.6 | low terrace | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, gravel > 0.5 inch - refusal due to gravel | 2C5 | SW | 15.2 | <4 | 590 | 190 | 160 | 190 | 1100 | 150 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-NE35 | 8/17/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, granular, moist, loose, Non-plastic, many medium roots, many - very fine, fine and medium roots | A | SW | 6 | 7 | 550 | 230 | 250 | 350 | 1400 | 200 | Dow |
| RM-268+00-NE35 | 8/17/2006 | 0.4-0.6 | intermediate terrace | 10YR 6/4 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots, very and fine roots | C | SW | 2.4 | 8 | 1700 | 1600 | 1600 | 1700 | 6500 | 960 | Dow |
| RM-268+00-NE35 | 8/17/2006 | 0.6-1.3 | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, moist, granular, moist, loose, Non-plastic, common very fine roots, fine and very fine roots | 2Ab | SW | 3.6 | 48 | 890 | 240 | 260 | 580 | 2000 | 310 | Alta |
| RM-268+00-NE35 | 8/17/2006 | 1.3-1.8 | intermediate terrace | 10YR 6/4 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | 2C | SW | 1.9 | 8 | 380 | 210 | 220 | 500 | 1300 | 180 | Dow |
| RM-268+00-NE35 | 8/17/2006 | 1.8-2.4 | intermediate terrace | 10YR 4/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | 2C2 | SW | 2.7 | 5 | 4600 | 1400 | 1700 | 1000 | 8700 | 1200 | Dow |
| RM-268+00-NE35 | 8/17/2006 | 2.4-3.1 | intermediate terrace | 2.5Y 3/3 dark olive brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | 3C3 | SM | 8.9 | <4 | 10 | 4 | 5 | 6 | 25* | <10* | Dow |
| RM-268+00-NE35 | 8/17/2006 | 3.1-3.5 | intermediate terrace | 10YR 6/4 light yellowish brow sand, moist, single grain, moist, loose, Non-plastic | 4C4 | SW | 2.1 | <4 | 210 | 100 | 100 | 120 | 530 | 75 | Dow |
| RM-268+00-NE35 | 8/17/2006 | 3.5-4.0 | intermediate terrace | 2.5Y 3/3 dark olive brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | 5C5 | SM | 10.1 | <4 | 15 | 12 | 8 | 19 | 54 | <10* | Dow |
| RM-268+00-NE35 | 8/17/2006 | 4.0-4.3 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy loam, moist, single grain, moist, loose, Non-plastic | 6C6 | SW | 4 | 7 | 180 | 82 | 76 | 150 | 500 | 72 | Alta |
| RM-268+00-NE35 | 9/10/2006 | 4.3-5.3 | intermediate terrace | 10YR 4/4 dark yellowish brown, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Thin <5 cm well graded sand. plant layer 0.5cm at 7.2 | 66 | ML/CL | 13.1 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RM-268+00-NE35 | 9/10/2006 | 5.3-6.3 | intermediate terrace | 10YR 4/4 dark yellowish brown, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Thin <5 cm well graded sand. plant layer 0.5cm at 7.2 | 66 | ML/CL | 8.6 | <4 | 15 | 6 | 9 | 16 | 47* | <10* | Dow |
| RM-268+00-NE35 | 9/10/2006 | 6.3-7.2 | intermediate terrace | 10YR 4/4 dark yellowish brown, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, Thin <5 cm well graded sand. plant layer 0.5cm at 7.2 | 66 | ML/CL | 9.6 | <4 | 28 | 9 | 9 | 23 | 70 | 11 | Alta |
| RM-268+00-NE35 | 9/10/2006 | 7.2-8.3 | intermediate terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic | 8C8 | SP | 5.2 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RM-268+00-NE35 | 9/10/2006 | 8.3-9.3 | intermediate terrace | 10YR 4/4 dark yellowish brown loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, 5 inch sand layer at 8.7ft - poorly graded sand (SP) common medium mottles | 9C9 | ML/CL | 13.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-NE5 | 8/17/2006 | 0.0-0.6 | floodplain | 2.5Y 4/4 olive brown very fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, 0-0.2 feet 2.5Y 4/4 0.2-0.4 feet Gley 2 4/10B 0.4-0.6 feet 2.5 YR 6/3 medium sand and loamy fine sand few fine and very fine roots and other organic detritus | -- | SP-SM | 13.5 | <4 | 68 | 18 | 18 | 22 | 130 | 18 | Alta |
| RM-268+00-NE5 | 8/17/2006 | 0.6-1.9 | floodplain | 10YR 5/2 grayish brown sand, common 10YR 5/8 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, sand and loamy sand | C1 | SP-SM | 15.9 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RM-268+00-NE5 | 8/17/2006 | 1.9-2.6 | floodplain | 10Y 6/1 greenish gray loamy sand, wet, single grain, moist, loose, Non-plastic | Cg2 | SM | 16.9 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RM-268+00-NE5 | 8/17/2006 | 2.6-3.5 | floodplain | 10Y 6/1 greenish gray loamy sand, few 10YR 5/6 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, sand and loamy sand | Cg3 | SP-SM | 16.8 | <4 | <4 | 6 | 4 | <4 | <20 [*] | <10 [*] | Alta |
| RM-268+00-NE5 | 9/10/2006 | 3.5-5.0 | floodplain | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, poorly graded sand white shells at 4.3 feet few < 7mm diameter | C4 | SP | 15.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-268+00-NE5 | 9/10/2006 | 5.0-5.5 | floodplain | 5GY 6/1 greenish gray loamy sand, wet, granular, moist, friable, slightly plastic, granular/ single grain | C5 | SW | 16.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-268+00-NE570 | 8/18/2006 | 0.0-0.7 | high terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, granular, dry, slightly hard, slightly plastic, many fine roots | A | SW | 22.1 | 9 | 2100 | 630 | 610 | 570 | 3900 | 530 | Alta |
| RM-268+00-NE570 | 8/18/2006 | 0.7-2.0 | high terrace | 10YR 5/6 yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic, few fine roots, gravelly loamy sand, 15-35% fine and medium gravel | Bs | SW | 26 | <4 | 87 | 31 | 26 | 40 | 180 | 25 | Alta |
| RM-268+00-SW130 | 8/29/2006 | 0.0-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, moist, firm, moderately plastic, few very fine roots | A | SC | 21 | 12 | 440 | 230 | 220 | 250 | 1100 | 170 | Dow |
| RM-268+00-SW130 | 8/29/2006 | 1.2-2.2 | low terrace | 10YR 4/4 dark yellowish brown loam, moist, moist, firm, slightly plastic, slightly to moderately plastic | Bw | SC | 19.8 | <4 | 26 | 16 | 15 | 17 | 73 | 13 | Dow |
| RM-268+00-SW130 | 8/29/2006 | 2.2-3.3 | low terrace | 10YR 3/3 dark brown loam, moist, moist, firm, moderately plastic | C1 | SC | 19.3 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RM-268+00-SW130 | 8/29/2006 | 3.3-4.4 | low terrace | 10YR 3/4 dark yellowish brown loam, moist, moist, firm, moderately plastic | C2 | SC | 21.6 | <4 | 14 | 7 | 6 | 9 | 36 [*] | <10 [*] | Dow |
| RM-268+00-SW130 | 8/29/2006 | 3.3-4.4 Lab Duplicate | low terrace | 10YR 3/4 dark yellowish brown loam, moist, moist, firm, moderately plastic | C2 | SC | 20.5 | <4 | 19 | 10 | 9 | 11 | 48 [*] | <10 [*] | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+00-SW20 | 8/29/2006 | 0.0-0.3 | natural levee | 2.5Y 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, many very fine roots | A | SP | 13.4 | 5 | 1300 | 360 | 410 | 300 | 2400 | 330 | Dow |
| RM-268+00-SW20 | 8/29/2006 | 0.3-1.2 | natural levee | 2.5Y 4/3 olive brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | Bw | SP | 8.7 | 20 | 1600 | 630 | 650 | 770 | 3600 | 510 | Dow |
| RM-268+00-SW20 | 8/29/2006 | 1.2-3.0 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots | C1 | SP | 4.1 | 30 | 2100 | 770 | 850 | 1300 | 5000 | 710 | Dow |
| RM-268+00-SW20 | 8/29/2006 | 3.0-4.6 | natural levee | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 5.7 | 16 | 3500 | 1900 | 2000 | 2900 | 10000 | 1400 | Dow |
| RM-268+00-SW20 | 8/29/2006 | 4.6-6.0 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very coarse roots, could not auger below 4.8 feet due to tree roots | C3 | SP | 3.8 | 10 | 1900 | 810 | 810 | 1300 | 4900 | 670 | Dow |
| RM-268+00-SW20 | 10/23/2006 | 6.0-7.0 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 3/3 dark brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots, 10 YR 5/4 (yellowish brown) single grain fine sand (SP) layers throughout predominant sandy loam matrix | C4 | SW | 7.1 | 18 | 46000 | 31000 | 25000 | 24000 | 120000 | 17000 | Alta |
| RM-268+00-SW20 | 10/23/2006 | 7.0-8.0 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 3/3 dark brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots, 10 YR 5/4 (yellowish brown) single grain fine sand (SP) layers throughout predominant sandy loam matrix | C4 | SW | 7.2 | 5 | 24000 | 11000 | 8900 | 8100 | 51000 | 6800 | Alta |
| RM-268+00-SW20 | 10/23/2006 | 8.0-9.0 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 3/3 dark brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots, 10 YR 5/4 (yellowish brown) single grain fine sand (SP) layers throughout predominant sandy loam matrix Wet at 8.5 ft | C4 | SW | 13.1 | <4 | 4200 | 1500 | 1400 | 1100 | 8300 | 1100 | Alta |
| RM-268+00-SW20 | 10/23/2006 | 9.0-10.0 | natural levee | 10YR 5/4 yellowish brown fine sand, wet, single grain, moist, loose, Non-plastic, few fine roots | C5 | SP | 19.4 | <4 | 6900 | 4000 | 3000 | 2800 | 17000 | 2200 | Alta |
| RM-268+00-SW70 | 8/29/2006 | 0.0-0.6 | historic natural levee | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SC | 16 | 16 | 1300 | 680 | 670 | 820 | 3500 | 500 | Dow |
| RM-268+00-SW70 | 8/29/2006 | 0.6-1.3 | historic natural levee | 2.5Y 3/2 very dark grayish br loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | A/B | SC | 9.3 | 4 | 1900 | 1100 | 1000 | 1000 | 5100 | 700 | Dow |
| RM-268+00-SW70 | 8/29/2006 | 1.3-2.2 | historic natural levee | 10YR 4/3 brown loamy fine sand, subangular blocky, moist, very friable, slightly plastic | Bw | SP | 5.3 | <4 | 790 | 400 | 360 | 350 | 1900 | 260 | Dow |
| RM-268+00-SW70 | 8/29/2006 | 2.2-3.0 | historic natural levee | 10YR 3/3 dark brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | C1 | SP | 8.7 | <4 | 260 | 140 | 140 | 130 | 670 | 95 | Dow |
| RM-268+00-SW70 | 8/29/2006 | 3.0-4.1 | historic natural levee | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | C2 | SP | 5.7 | <4 | 38 | 15 | 14 | 14 | 81 | 13 | Dow |
| RM-268+00-SW70 | 8/29/2006 | 4.1-5.5 | historic natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | C3 | SP | 6.2 | <4 | 17 | 8 | 8 | 7 | 40* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|------------------------------|--------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+05-NE20 | 10/22/2006 | 0.4-1.6 | high terrace | | 3 | -- | 6.1 | 8 | 750 | 400 | 320 | 350 | 1800 | 250 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 1.6-3.5 | high terrace | | 3 | -- | 11.3 | 36 | 2000 | 1000 | 920 | 1500 | 5500 | 760 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 3.5-4.6 | high terrace | | 3 | -- | 3.4 | 7 | 13000 | 7000 | 6800 | 5700 | 33000 | 4600 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 3.5-4.6 Lab Duplicate | high terrace | | 3 | -- | 3.8 | 14 | 9500 | 4300 | 4100 | 3400 | 21000 | 2900 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 4.6-5.5 | high terrace | | 3 | -- | 8.9 | <4 | 360 | 180 | 170 | 140 | 850 | 120 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 5.5-6.5 | high terrace | | 3 | -- | 7.8 | <4 | 100 | 84 | 59 | 68 | 310 | 43 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 6.5-7.5 | high terrace | | 3 | -- | 13.1 | <4 | <4 | <4 | <4 | <6 ^{LISR} | <22 | <10 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 7.5-8.5 | high terrace | | 3 | -- | 11.5 | <4 | 460 | 220 | 220 | 230 | 1100 | 160 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 8.5-9.5 | high terrace | | 3 | -- | 9.1 | <4 | 9 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RM-268+05-NE20 | 10/22/2006 | 9.5-10.5 | high terrace | | 3 | -- | 13.2 | <4 | 16 | 5 | <4 | <7 ^{LISR} | <23 [*] | <10 [*] | Dow |
| RM-268+05-NE20 | 10/22/2006 | 10.5-11.0 | high terrace | | -- | -- | 13.7 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 11.0-11.5 | high terrace | | -- | -- | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 11.5-13.2 | high terrace | | -- | -- | 14.2 | <4 | 4 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RM-268+05-NE20 | 10/22/2006 | 11.5-13.2 Field Duplicate | high terrace | | -- | -- | 15.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 13.2-14.7 | high terrace | | -- | -- | 15.6 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RM-268+05-NE20 | 10/22/2006 | 13.2-14.7 Field Duplicate | high terrace | | -- | -- | 15.7 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+05-NE20 | 10/22/2006 | 14.7-16.0 | high terrace | | -- | -- | 14.9 | <4 | <4 | <5 | <5 | <10 ^{LISR} | <28 | <10 | Dow |

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|---|-----------------|-------------------------|----------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+05-NE35 | 10/22/2006 | 0.0-0.4 | intermediate terrace | | 17 | -- | 13.2 | 35 | 820 | 400 | 440 | 810 | 2500 | 370 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 0.4-0.6 | intermediate terrace | | 17 | -- | 8.5 | 11 | 560 | 300 | 340 | 620 | 1800 | 260 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 0.6-1.3 | intermediate terrace | | 17 | -- | 12.2 | <4 | 290 | 140 | 130 | 98 | 660 | 92 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 1.3-1.8 | intermediate terrace | | 17 | -- | 1.8 | <4 | <4 | <4 | <4 | 4 | <20 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 1.8-2.4 | intermediate terrace | | 17 | -- | 6.8 | 47 | <4 | <4 | <4 | <4 | 47* | 48 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 2.4-3.1 | intermediate terrace | | 17 | -- | 7.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 3.1-3.5 | intermediate terrace | | 17 | -- | 0.7 | <4 | 5 | 5 | 4 | 5 | <20 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 3.5-4.0 | intermediate terrace | | 17 | -- | 3.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 4.0-4.3 | intermediate terrace | | 17 | -- | 8.9 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 4.3-7.2 | intermediate terrace | | 17 | -- | 7.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 7.2-8.3 | intermediate terrace | | 17 | -- | 4 | <4 | <4 | <4 | <4 | <8 LISR | <20 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 8.3-9.3 | intermediate terrace | | 17 | -- | 10.9 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 9.3-9.7 | intermediate terrace | | -- | -- | 13.6 | <4 | <4 | <4 | <5 LISR | <8 LISR | <25 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 9.7-9.8 | intermediate terrace | | -- | -- | 3.2 | <4 | 5 | <4 | <4 | <6 LISR | <22 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 9.8-10.0 | intermediate terrace | | -- | -- | 15.6 | <4 | 12 | <4 | <4 | <6 LISR | <22 * | <10 * | Dow |
| RM-268+05-NE35 | 10/22/2006 | 10.0-10.8 | intermediate terrace | | -- | -- | 18 | <4 | <4 | <4 | <4 | <5 LISR | <21 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 10.8-11.9 | intermediate terrace | | -- | -- | 17.4 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+05-NE35 | 10/22/2006 | 11.9-13.1 | intermediate terrace | | -- | -- | 14.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 13.1-13.3 | intermediate terrace | | -- | -- | 12.7 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RM-268+05-NE35 | 10/22/2006 | 13.3-15.0 | intermediate terrace | | -- | -- | 16.3 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |

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|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+50-NE20 | 10/22/2006 | 0.0-1.7 | natural levee | 10YR 4/2 dark grayish brown and 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots, Recent deposition burying a developed soil. | C1 | SP | 9.1 | 17 | 1900 | 1000 | 920 | 1000 | 4900 | 680 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 1.7-3.2 | natural levee | 10YR 2/2 very dark brown loamy fine sand, moist, granular, weak, moist, very friable, Non-plastic, few fine roots | Ab | SP | 9.8 | <4 | 410 | 91 | 120 | 73 | 690 | 96 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 3.2-4.4 | natural levee | 10YR 4/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moderate, moist, very friable, Non-plastic, Horizon divided for analysis. Horizon should be Bsb (not possible to enter two suffixes). | Bs | SP | 5 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-268+50-NE20 | 10/22/2006 | 4.4-5.5 | natural levee | 10YR 4/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moderate, moist, very friable, Non-plastic, very few fine roots, Horizon divided for analysis. Horizon should be Bsb (not possible to enter two suffixes). | 2Bs2 | SP | 6.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 5.5-6.6 | natural levee | 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots, Primarily very fine sandy loam, but ranges from loamy vf sand to sandy clay loam. Thin layers of 10YR 6/4 vf sand at 5.5 ft and 6.3 ft.**** | 2C2 | SC | 7.7 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-268+50-NE20 | 10/22/2006 | 6.6-7.7 | natural levee | 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots, Primarily very fine sandy loam, but ranges from loamy vf sand to sandy clay loam.**** | 2C2 | SC | 10 | <4 | 6 | <4 | <4 | <6 LISR | <22 * | <10 * | Dow |
| RM-268+50-NE20 | 10/22/2006 | 7.7-8.8 | natural levee | 10YR 5/4 yellowish brown very fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots, Primarily very fine sandy loam, but ranges from loamy vf sand to sandy clay loam.**** | 2C2 | SC | 9.2 | <4 | <4 | <4 | <4 | <6 LISR | <22 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 8.8-9.8 | natural levee | 10YR 5/3 brown and 10YR 4/3 brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of very fine sandy loam and very fine sand. Vf sand is SP, loose, and nonplastic.**** | 2C3 | SC | 12 | <4 | <4 | <5 LISR | <5 LISR | <9 LISR | <27 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 9.8-10.8 | natural levee | 10YR 5/3 brown and 10YR 4/3 brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of very fine sandy loam and very fine sand. Vf sand is SP, loose, and nonplastic.**** | 2C3 | SC | 9.7 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 10.8-11.8 | natural levee | 10YR 5/3 brown and 10YR 4/3 brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of very fine sandy loam and very fine sand. Vf sand is SP, loose, and nonplastic.**** | 2C3 | SC | 13.3 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 11.8-12.9 | natural levee | 10YR 5/3 brown and 10YR 4/3 brown very fine sandy loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, friable, slightly plastic, Alternating layers of very fine sandy loam and very fine sand. Vf sand is SP, loose, and nonplastic.**** | 2C3 | SC | 12.6 | <4 | <4 | <4 | <4 | <6 LISR | <22 | <10 | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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"--" indicates data that was not collected for the given soil sample

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-268+50-NE20 | 10/22/2006 | 12.9-14.2 | natural levee | 2.5Y 5/3 light olive brown loamy fine sand, wet, structureless, moist, friable, slightly plastic, Primarily loamy fine sand, but ranges from fine sand to fine sandy loam,""" | 2C4 | SC | 16.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 14.2-16.0 | natural levee | 2.5Y 5/1 gray sand, common 2.5Y 5/4 light olive brown mottle, wet, structureless, moist, loose, Non-plastic, Layers of silty clay loam at 14.3 ft and 15.8 ft. | 2Cg | SP | 15.4 | <4 | <4 | <6 ^{LISR} | <7 ^{LISR} | <13 ^{LISR} | <34 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 16.0-16.9 | natural levee | 2.5Y 4/2 dark grayish brown coarse sand, 35-60% gravel, wet, structureless, moist, loose, Non-plastic, Begins to mix with more clayey material at very bottom of horizon. | 3Cg2 | SW | 6.1 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RM-268+50-NE20 | 10/22/2006 | 16.9-20.0 | natural levee | 2.5Y 4/1 dark gray and 2.5Y 4/2 dark grayish brown clay, moist, massive, moist, extremely firm, very plastic, Second soil color present only in upper 0.4 ft of horizon. | 4Cg3 | CH | 15.6 | <4 | <4 | <5 ^{LISR} | <6 | <11 ^{LISR} | <30 | <10 | Dow |
| RM-271+00-NE150 | 11/4/2006 | 0.0-0.4 Field Duplicate | intermediate terrace | 10YR 2/1 black fine sand; moist, granular; moist, loose, Non-plastic, common fine roots | A | SP | 22 | 28 | 1700 | 770 | 720 | 1000 | 4200 | 590 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 0.0-0.4 | intermediate terrace | 10YR 2/1 black fine sand, moist, granular, moist, loose, Non-plastic, common fine roots | A | SP | 22.5 | 26 | 1500 | 650 | 610 | 880 | 3600 | 510 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 0.4-1.6 | intermediate terrace | 10YR 5/6 yellowish brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C1 | SP | 5 | <9 ^{LISR} | 5900 | 2600 | 2500 | 3700 | 15000 | 2000 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 1.6-2.7 | intermediate terrace | 10YR 5/6 yellowish brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, Horizon divided for sample analysis. | C1 | SP | 6.3 | 6 | 27000 | 12000 | 10000 | 7300 | 56000 | 7600 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 2.7-4.1 | intermediate terrace | 10YR 3/3 dark brown fine sandy loam, subangular blocky, weak, moist, friable, slightly plastic, very few medium roots, Grades to loamy fine sand at top of horizon. | C2 | SM | 14.5 | <4 | 14000 | 6800 | 5200 | 4800 | 30000 | 4000 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 4.1-4.8 | intermediate terrace | 10YR 4/3 brown fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic | C3 | SM | 12 | <4 | 45 | 17 | 16 | 14 | 93 | 15 | Alta |
| RM-271+00-NE150 | 11/4/2006 | 4.8-5.7 | intermediate terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, Horizon divided for sample analysis. Borderline fine sandy loam. | C4 | SP-SM | 10.4 | <4 | 20 | 6 | 5 | 5 | 37* | <10* | Alta |
| RM-271+00-NE150 | 11/4/2006 | 5.7-6.6 | intermediate terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, Horizon divided for sample analysis. Borderline fine sandy loam. | C4 | SP-SM | 10.9 | <4 | 9 | <4 | 4 | <4 | <20* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-271+00-NE190 | 11/4/2006 | 0.0-0.4 Field Duplicate | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A4 | ML/CL | 25.4 | 59 | 4900 | 2300 | 1900 | 2900 | 12000 | 1600 | Alta |
| RM-271+00-NE190 | 11/4/2006 | 0.0-0.4 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A4 | ML/CL | 25.5 | 45 | 5500 | 3000 | 2100 | 3400 | 14000 | 1800 | Alta |
| RM-271+00-NE190 | 11/4/2006 | 0.4-0.8 | low terrace | 2.5Y 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, weak, moist, very friable, slightly plastic | Bw | SP-SM | 18 | 22 | 12000 | 5000 | 3600 | 6300 | 26000 | 3300 | Alta |
| RM-271+00-NE190 | 11/4/2006 | 0.8-3.1 | low terrace | 10YR 4/2 dark grayish brown loam, few 10YR 5/6 yellowish brown mottle, wet, angular blocky, moist, friable, slightly plastic, Wet below 1.8'. Thin layer of fine sand at 0.9'. | C1 | ML/CL | 20.1 | <4 | 9900 | 2800 | 2500 | 1800 | 17000 | 2200 | Alta |
| RM-271+00-NE190 | 11/4/2006 | 3.1-4.4 | low terrace | 10YR 4/1 dark gray clay loam, many 10YR 5/6 yellowish brown mottle, wet, massive, moist, firm, very plastic | C2 | CL | 20.4 | <4 | 63 | 22 | 17 | 15 | 120 | 17 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-271+00-NE20 | 10/24/2006 | 0.0-0.9 | natural levee | 10YR 2/1 black and 10YR 3/2 very dark grayish br fine sand, moist, granular, moist, very friable, Non-plastic, many fine roots, Few medium roots. | A | SP | 11 | 11 | 16000 | 6000 | 5700 | 4900 | 33000 | 4400 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 0.9-1.2 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 4.3 | 4 | 24000 | 9900 | 8300 | 6700 | 49000 | 6400 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 1.2-2.7 | natural levee | 10YR 3/1 very dark gray and 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots | 2Ab | SP | 7.6 | <4 | 1900 | 760 | 620 | 560 | 3900 | 500 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 2.7-4.5 | natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few very fine roots, Horizon is 2Bsb. | 2Bs | SP | 8 | <4 | 100 | 60 | 39 | 50 | 250 | 34 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 4.5-4.9 | natural levee | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, Possibly buried A horizon. | 2C2 | SP | 6.9 | <4 | 7800 | 2600 | 2300 | 1900 | 15000 | 1900 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 4.9-6.3 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | 2C3 | SP | 3.6 | <4 | 6 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 6.3-8.5 | natural levee | 10YR 3/3 dark brown and 10YR 4/4 dark yellowish brown fine sandy loam, dry, subangular blocky, weak, dry, slightly hard, slightly plastic | 2C4 | SC | 5.5 | <4 | 1400 | 680 | 530 | 550 | 3200 | 410 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 8.5-8.9 | natural levee | 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic | 25 | SP | 1.8 | <4 | 19 | 16 | 9 | 17 | 61 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 8.9-9.7 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 6/4 light yellowish brow loamy fine sand, moist, structureless, moist, very friable, Non-plastic, Layer of 10 YR 4/4 (fine sand) from 9.1' to 9.3'. | 2C6 | SP | 8.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 9.7-10.4 | natural levee | 10YR 6/4 light yellowish brow fine sand, dry, single grain, dry, loose, Non-plastic | 2C7 | SP | 1.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 10.4-11.9 | natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, moist, structureless, moist, very friable, slightly plastic | 2C8 | SC | 6.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 11.9-12.3 | natural levee | 10YR 6/4 light yellowish brow fine sand, dry, structureless, dry, loose, Non-plastic | 2C9 | SP | 3 | <4 | 57 | 21 | 19 | 18 | 120 | 18 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 12.3-14.5 | natural levee | 10YR 4/4 dark yellowish brown silty clay loam, moist, structureless, moist, firm, moderately plastic, Few thin layers 10YR 6/4 (fine sand) interspersed throughout. Few thin layers organic material near top of horizon. | 3C10 | CL | 12 | <4 | 2200 | 830 | 860 | 670 | 4600 | 630 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 14.5-16.4 | natural levee | 10YR 5/4 yellowish brown silty clay loam, common 10YR 5/6 yellowish brown mottle, moist, structureless, moist, firm, moderately plastic, Interbedded with fine sand throughout horizon. | 3C11 | CL | 16.8 | <4 | 19 | 9 | 7 | 8 | 44* | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 16.4-17.3 | natural levee | 10YR 6/1 gray fine sandy loam, few 10YR 6/6 brownish yellow mottle, wet, structureless, moist, friable, slightly plastic | 3C12 | SM | 17.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 17.3-19.0 | natural levee | 10YR 4/1 dark gray silty clay loam, wet, structureless, moist, firm, moderately plastic, Interbedded silty clay loam and fine sand throughout horizon. | 3Cg1 | CL | 31 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-271+00-NE20 | 10/24/2006 | 19.0-20.1 | natural levee | 10YR 4/1 dark gray fine sand, wet, structureless, moist, loose, Non-plastic, Mostly fine sand, some thin layers of silty clay loam. | 3Cg2 | SP | 20 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 20.1-22.4 | natural levee | 10YR 5/1 gray silty clay loam, wet, structureless, moist, firm, slightly plastic, Few thin layers sandy clay loam. | 3Cg3 | CL | 18.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE20 | 10/24/2006 | 22.4-24.0 | natural levee | 10YR 5/1 gray fine sand, few 2.5Y 5/6 light olive brown mottle, wet, structureless, moist, loose, Non-plastic, Mostly fine sand with some layers of sandy clay loam. | 3Cg4 | SP | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 0.0-0.4 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A2 | ML/CL | 26.5 | 46 | 14000 | 6400 | 5500 | 5600 | 32000 | 4300 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 0.0-0.4 Field Duplicate | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A2 | ML/CL | 25.5 | 12 | 15000 | 6600 | 5500 | 5500 | 32000 | 4300 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 0.4-1.2 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic | Bw | SM | 19.2 | 7 | 21000 | 8000 | 6600 | 5200 | 41000 | 5300 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 1.2-1.7 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic | C1 | ML/CL | 21.1 | <4 | 630 | 260 | 230 | 220 | 1300 | 180 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 1.7-3.0 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, many 10YR 5/6 yellowish brown mottle, wet, angular blocky, moist, firm, moderately plastic, Horizon divided for sample analysis. | C2 | CL | 16.6 | <4 | 89 | 28 | 23 | 19 | 160 | 23 | Alta |
| RM-271+00-NE420 | 11/4/2006 | 3.0-4.4 | low terrace | 10YR 4/2 dark grayish brown sandy clay loam, many 10YR 5/6 yellowish brown mottle, wet, angular blocky, moist, firm, moderately plastic, Horizon divided for sample analysis. | C2 | CL | 17.3 | <4 | 21 | 7 | 6 | 5 | 39* | <10 * | Alta |
| RM-272+50-SW200 | 11/6/2006 | 0.0-1.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots | A1 | SC | 13.5 | <4 | 32 | 16 | 14 | 21 | 82 | 13 | Alta |
| RM-272+50-SW200 | 11/6/2006 | 1.2-2.3 | intermediate terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, firm, moderately plastic, few very fine roots | A2 | CL | 21.3 | 4 | 140 | 66 | 56 | 78 | 340 | 49 | Alta |
| RM-272+50-SW200 | 11/6/2006 | 2.3-3.3 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, few 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, angular blocky, weak, moist, firm, moderately plastic, very few very fine roots | C | CL | 19.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-272+50-SW75 | 11/6/2006 | 0.0-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, slightly plastic, common very fine roots, Horizon divided for sample analysis. | A | ML/CL | 20 | 11 | 890 | 420 | 360 | 420 | 2100 | 290 | Alta |
| RM-272+50-SW75 | 11/6/2006 | 1.2-2.4 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, slightly plastic, common very fine roots, Horizon divided for sample analysis. | A | ML/CL | 24.8 | <4 | 92 | 41 | 36 | 44 | 210 | 30 | Alta |
| RM-272+50-SW75 | 11/6/2006 | 2.4-4.0 | low terrace | 7.5YR 3/4 dark brown fine sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic | Bw | SC | 16.9 | <4 | 9 | 5 | 4 | 5 | 23* | <10 * | Alta |
| RM-272+50-SW75 | 11/6/2006 | 4.0-4.8 | low terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 13.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-272+50-SW75 | 11/6/2006 | 4.8-5.5 | low terrace | 10YR 3/2 very dark grayish br and 10YR 3/3 dark brown clay loam, moist, granular, moist, firm, moderately plastic, Borderline loam. | 2Ab | CL | 24.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-272+50-SW75 | 11/6/2006 | 5.5-6.6 | low terrace | 10YR 4/3 brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, very firm, very plastic, Horizon grades from clay loam to clay with depth. | 2C2 | CH | 25.4 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+00-IC-C | 10/9/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few coarse sand very few angular gloss black coarse sand subrounded grains well sorted | 1 | SP | 3.2 | <4 | 32 | 10 | 11 | 12 | 64 | 10 | Dow |
| RM-276+00-IC-C | 10/9/2006 | 0.4-1.0 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand few coarse sand very few shell fragments very few angular glossy black coarse sand subrounded grains well sorted | 2 | SP | 4.3 | <4 | 22 | 5 | 5 | 8 | 40* | <10 * | Dow |
| RM-276+00-IC-C | 10/9/2006 | 1.0-1.6 | in-channel | 10YR 4/2 dark grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic, meidium loamy sand few coarse sand very few angular glossy black coarse sand subrounded grains very few shell fragments | 3 | SM | 12.9 | <4 | 19 | 4 | 6 | 5 | 34* | <10 * | Dow |
| RM-276+00-IC-C | 10/9/2006 | 1.6-2.0 | in-channel | 10YR 3/1 very dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few medium sand very few fine gravel few angular glossy black coarse sand subrounded grains | 4 | SM | 15.7 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-276+00-IC-NE | 10/9/2006 | 0.0-2.1 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand few coarse sand very few shell fragments very few fine gravel subrounded grains very few angular glossy black coarse sand well sorted Duplicate sample collected | 1 | SP | 3.8 | <4 | 15 | 4 | 5 | 9 | 32* | <10 * | Dow |
| RM-276+00-IC-NE | 10/9/2006 | 0.0-2.1 Field Duplicate | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand few coarse sand very few shell fragments very few fine gravel subrounded grains very few angular glossy black coarse sand well sorted Duplicate sample collected | 1 | SP | 3.8 | <4 | 13 | <4 | 4 | 5 | 22* | <10 * | Dow |
| RM-276+00-IC-NE | 10/9/2006 | 2.1-2.8 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine gravel common shell fragments few angular gloss black coarse sand subrounded grains | 2 | SM | 11.1 | <4 | 58 | 20 | 23 | 33 | 130 | 20 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-IC-SW | 10/9/2006 | 0.0-1.3 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand common coarse sand very few fine gravel very few shell fragments very few angular coarse black sand subround grains somewhat well sorted | 1 | SP | 3 | <4 | 36 | 7 | 10 | 11 | 64 | <10 * | Dow |
| RM-276+00-IC-SW | 10/9/2006 | 1.3-1.7 | in-channel | 10YR 4/2 dark grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand very few coarse sand very few fine gravel very few shell fragments very few angular glossy black coarse sand subrounded grains | 2 | SM | 13.8 | <4 | 46 | 17 | 16 | 18 | 97 | 15 | Dow |
| RM-276+00-IC-SW | 10/9/2006 | 1.7-2.3 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine gravel few shell fragments few angular glossy black coarse sand subrounded grains | 3 | SM | 10.9 | <4 | 230 | 83 | 86 | 64 | 470 | 66 | Dow |
| RM-276+00-NE1120 | 8/18/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br loamy sand, dry, granular, dry, soft, Non-plastic, many fine roots | A | SW | 16.7 | 8 | 510 | 180 | 150 | 210 | 1100 | 140 | Alta |
| RM-276+00-NE1120 | 8/18/2006 | 0.8-2.0 | high terrace | 10YR 5/6 yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic, few fine roots | Bs | SW | 3.1 | <4 | 52 | 20 | 16 | 24 | 110 | 16 | Alta |
| RM-276+00-NE1120 | 8/18/2006 | 2.0-2.4 | high terrace | 2.5Y 5/4 light olive brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+00-NE1120 | 8/18/2006 | 2.4-3.0 | high terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, medium sand | 2C2 | SW | 6.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE130 | 8/20/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/1 very dark gray loamy fine sand, dry, granular, dry, soft, Non-plastic, common very fine roots | A2 | SP | 10.1 | 5 | 7100 | 2800 | 2800 | 2400 | 15000 | 2100 | Dow |
| RM-276+00-NE130 | 8/20/2006 | 0.4-1.4 | intermediate terrace | 10YR 4/2 dark grayish brown loamy fine sand, dry, subangular blocky, dry, soft, Non-plastic | E | SP | 4.7 | 32 | 18000 | 9000 | 8200 | 5200 | 41000 | 5600 | Dow |
| RM-276+00-NE130 | 8/20/2006 | 1.4-2.5 | intermediate terrace | 10YR 3/4 dark yellowish brown loamy fine sand, dry, subangular blocky, dry, soft, Non-plastic | Bs1 | SP | 6.4 | <4 | 1100 | 410 | 420 | 310 | 2200 | 300 | Dow |
| RM-276+00-NE130 | 8/20/2006 | 2.5-3.4 Lab Duplicate | intermediate terrace | 10YR 3/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic | Bs2 | SP | 7.4 | <4 | 8 | 4 | 4 | <4 | <20 * | <10 * | Dow |
| RM-276+00-NE130 | 8/20/2006 | 2.5-3.4 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic | Bs2 | SP | 7.7 | <4 | 10 | 4 | <4 | 6 | 20* | <10 * | Dow |
| RM-276+00-NE130 | 8/20/2006 | 3.4-4.4 | intermediate terrace | 10YR 3/3 dark brown fine sandy loam, common mottle, moist, slightly plastic, Common faint mottles | C | SP | 11.2 | <4 | 460 | 240 | 240 | 200 | 1100 | 160 | Dow |
| RM-276+00-NE130 | 9/11/2006 | 4.4-5.4 | intermediate terrace | 10YR 5/2 grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, layers of poorly graded, yellowish brown sand (SP) 10YR 5/4 | C2 | ML/CL | 11 | <4 | <6 | <4 | <4 | <4 | <22 | <10 | Alta |
| RM-276+00-NE130 | 9/11/2006 | 5.4-6.5 | intermediate terrace | 10YR 5/2 grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, layers of poorly graded, yellowish brown sand (SP) 10YR 5/4 | C2 | ML/CL | 15.4 | <4 | 120 | 43 | 35 | 35 | 230 | 31 | Alta |
| RM-276+00-NE130 | 9/11/2006 | 6.5-7.4 | intermediate terrace | 10YR 5/2 grayish brown clay, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, common medium mottles | C3 | CL | 15.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+00-NE1740 | 8/18/2006 | 0.0-0.7 | high terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, friable, moderately plastic, common fine roots, sandy loam (SM) to Loam (ML) | A | SM | 20.4 | 15 | 330 | 110 | 97 | 150 | 710 | 110 | Alta |
| RM-276+00-NE1740 | 8/18/2006 | 0.7-2.0 | high terrace | 10YR 4/1 dark gray sandy loam, few mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, slightly to moderately plastic, few medium faint mottles | C/A | SM | 11.4 | <4 | 13 | 4 | 4 | 8 | 30* | <10 * | Alta |
| RM-276+00-NE1740 | 8/18/2006 | 2.0-3.3 | high terrace | 2.5Y 5/2 grayish brown sandy clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | C | CL | 13.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE190 | 8/20/2006 | 0.0-0.6 | low terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots | A | SM | 14.3 | 28 | 12000 | 7100 | 5400 | 5800 | 30000 | 4000 | Dow |
| RM-276+00-NE190 | 8/20/2006 | 0.6-1.4 | low terrace | 2.5Y 3/2 very dark grayish br fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, common very fine roots | A/B | SM | 9.9 | 22 | 15000 | 5300 | 5400 | 4300 | 30000 | 4100 | Dow |
| RM-276+00-NE190 | 8/20/2006 | 1.4-2.5 | low terrace | 10YR 4/2 dark grayish brown loamy fine sand, few mottle, moist, subangular blocky, moist, friable, slightly plastic, few fine faint mottles | Bw | SM | 9.8 | <4 | 500 | 230 | 230 | 210 | 1200 | 160 | Dow |
| RM-276+00-NE190 | 8/20/2006 | 2.5-4.4 | low terrace | 10YR 4/3 brown loamy fine sand, many 7.5YR 5/8 strong brown mottle, moist, moist, friable, slightly plastic, few very fine roots | C | SM | 11.5 | <4 | 130 | 63 | 65 | 71 | 330 | 47 | Dow |
| RM-276+00-NE190 | 9/11/2006 | 4.4-5.2 | low terrace | 10YR 4/6 dark yellowish brown fine sand, few 10YR 4/4 dark yellowish brown mottle, moist, single grain, moist, friable, non-plastic, poorly graded sand, few to medium mottles | C2 | SP | 10 | <4 | 9 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+00-NE190 | 9/11/2006 | 5.2-6.4 | low terrace | 10YR 5/4 yellowish brown sand, wet, single grain, wet, loose, non-plastic, layers of sandy loam, silty sand; water in boring at 3.6 feet | C3 | SP | 16.4 | <4 | 62 | 21 | 20 | 21 | 120 | 19 | Alta |
| RM-276+00-NE190 | 9/11/2006 | 6.4-7.4 | low terrace | 10YR 5/4 yellowish brown sand, wet, single grain, wet, loose, non-plastic, layers of sandy loam, silty sand; water in boring at 3.6 feet | C3 | SP | 16.8 | <4 | 31 | 12 | 11 | 11 | 65 | 11 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE20 | 8/21/2006 | 0.0-0.5 Field Duplicate | natural levee | 10YR 5/3 brown fine sand, dry, single grain, Non-plastic, few fine roots, other odor, Horizon - Overbank Flood Deposits | 3 | SP | 1 | <4 | 790 | 530 | 430 | 410 | 2200 | 290 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 0.0-0.5 | natural levee | 10YR 5/3 brown fine sand, dry, single grain, Non-plastic, few fine roots, other odor, Horizon - Overbank Flood Deposits | 3 | SP | 1.4 | <4 | 200 | 140 | 110 | 140 | 600 | 82 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 0.5-0.9 | natural levee | 10YR 4/3 brown fine sand, dry, single grain, Non-plastic, few fine roots, Incipient A horizon and possibly Bw exist but are to thin to be sampled | C1 | SP | 6.4 | 4 | 1200 | 720 | 570 | 700 | 3100 | 420 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 0.5-0.9 Field Duplicate | natural levee | 10YR 4/3 brown fine sand, dry, single grain, Non-plastic, few fine roots, Incipient A horizon and possibly Bw exist but are to thin to be sampled | C1 | SP | 6.5 | 6 | 1400 | 440 | 510 | 460 | 2800 | 390 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 0.9-1.7 | natural levee | 10YR 4/2 dark grayish brown fine sand, dry, single grain, Non-plastic | C2 | SP | 6.1 | 27 | 2000 | 1000 | 1100 | 1700 | 5800 | 830 | Dow |
| RM-276+00-NE20 | 8/20/2006 | 1.7-2.9 | natural levee | 10YR 4/3 brown fine sand, dry, single grain, Non-plastic | C3 | SP | 4.9 | 13 | 4200 | 1500 | 1500 | 2600 | 9800 | 1300 | Alta |
| RM-276+00-NE20 | 8/20/2006 | 2.9-4.6 | natural levee | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | C4 | SP | 3.1 | 9 | 45000 | 14000 | 12000 | 10000 | 81000 | 10000 | Alta |
| RM-276+00-NE20 | 8/20/2006 | 4.6-5.7 | natural levee | 10YR 6/3 pale brown and 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, Alternating layers of 10 YR 6/3 Fine sand and 10 YR 5/4 loamy fine sand, loose | C5 | SP | 2.7 | 12 | 43000 | 15000 | 13000 | 12000 | 83000 | 11000 | Alta |
| RM-276+00-NE20 | 8/21/2006 | 5.7-6.7 | natural levee | 10YR 4/2 dark grayish brown loamy fine sand, dry, single grain, dry, loose, Non-plastic, very few very coarse roots, single grained parting to subangular blocky, loose to soft | C6 | SP | 5.3 | 59 | 53000 | 14000 | 25000 | 19000 | 110000 | 17000 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 6.7-7.7 | natural levee | 10YR 6/3 pale brown and 10YR 5/4 yellowish brown fine sand, dry, single grain, Non-plastic, Alternating layers of 10YR 6/3 fine sand and 10YR 5/4 loamy fine sand, loamy fine sand - subangular blocky | C7 | SP | 4.5 | <4 | 7300 | 2800 | 3000 | 2300 | 15000 | 2100 | Dow |
| RM-276+00-NE20 | 8/21/2006 | 7.7-8.8 | natural levee | 10YR 6/3 pale brown and 10YR 4/3 brown fine sand, dry, single grain, Non-plastic, narrow bands of 10 YR 4/3 - loamy fine sand - and one narrow band of organic material | C8 | SP | 3.8 | 95 | 29000 | 7100 | 11000 | 4600 | 51000 | 7700 | Dow |
| RM-276+00-NE20 | 9/11/2006 | 8.8-9.8 | natural levee | 10YR 6/3 pale brown sand, few 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, few fine roots | C8 | SP | 5.4 | <4 | 18000 | 7300 | 5500 | 4200 | 35000 | 4500 | Alta |
| RM-276+00-NE20 | 9/11/2006 | 9.8-10.8 | natural levee | 10YR 4/3 brown and 10YR 3/2 very dark grayish br clay loam, common 10YR 6/8 brownish yellow and 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, Interbedded sand (10YR 4/3), well graded. Thin layer (0.5 inches) of woody material at 10.3'. Horizon divided for sample analysis. | C9 | CL | 14.6 | <4 | 120 | 44 | 37 | 39 | 240 | 34 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE20 | 9/11/2006 | 10.8-11.8 | natural levee | 10YR 4/3 brown and 10YR 3/2 very dark grayish br clay loam, common 10YR 6/8 brownish yellow and 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, Interbedded sand (10YR 4/3), well graded. Horizon divided for sample analysis. | C9 | CL | 20.3 | 16 | 45000 | 28000 | 20000 | 22000 | 110000 | 15000 | Alta |
| RM-276+00-NE20 | 9/11/2006 | 11.8-12.8 | natural levee | 10YR 4/3 brown and 10YR 3/2 very dark grayish br clay loam, common 10YR 6/8 brownish yellow and 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic, common fine roots, Interbedded sand (10YR 4/3), well graded. Horizon divided for sample analysis. | C9 | CL | 30.6 | <4 | 9 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RM-276+00-NE360 | 8/20/2006 | 0.0-0.5 | wetland | 10YR 2/1 black silt loam, moist, subangular blocky, moist, friable, slightly plastic, common very fine roots | A | ML | 48 | 27 | 2400 | 1300 | 1300 | 1300 | 6300 | 910 | Dow |
| RM-276+00-NE360 | 8/20/2006 | 0.5-2.2 | wetland | 10YR 3/2 very dark grayish br silty clay loam, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, Common spiral freshwater snail shells | C1 | CL | 28.4 | | 12000 | 6800 | 5200 | 5600 | 30000 | 3900 | Dow |
| RM-276+00-NE360 | 8/20/2006 | 2.2-3.3 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 5/8 yellowish brown mottle, wet, massive, firm, moderately plastic | C2 | CL | 31.2 | <4 | 230 | 100 | 93 | 72 | 500 | 70 | Dow |
| RM-276+00-NE360 | 8/20/2006 | 3.3-4.4 | wetland | 10YR 4/1 dark gray sandy clay loam, few 10YR 5/8 yellowish brown mottle, wet, massive, firm, moderately plastic | C3 | CL | 22.3 | <4 | 13 | 9 | 7 | 10 | 39* | <10 * | Dow |
| RM-276+00-NE360 | 9/11/2006 | 4.4-5.4 | wetland | 10Y 5/1 greenish gray clay, common 10YR 5/8 yellowish brown mottle, wet, massive, wet, firm, moderately plastic, fine to medium faint common mottles | C4 | CL | 24.7 | <4 | 38 | 26 | 22 | 24 | 110 | 17 | Dow |
| RM-276+00-NE360 | 9/11/2006 | 5.4-6.4 | wetland | 10Y 5/1 greenish gray clay, common 10YR 5/8 yellowish brown mottle, wet, massive, wet, firm, moderately plastic, fine to medium faint common mottles | C4 | CL | 25.1 | <4 | 160 | 72 | 79 | 93 | 400 | 58 | Dow |

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Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE50 | 8/20/2006 | 0.0-0.3 | high terrace | 10YR 3/1 very dark gray loamy fine sand, dry, granular, dry, soft, Non-plastic, many fine roots | A | SP | 6.7 | 7 | 6000 | 2700 | 2600 | 2200 | 14000 | 1900 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 0.3-1.2 | high terrace | 10YR 5/1 gray fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | E | SP | 4.4 | 5 | 6200 | 2500 | 2500 | 2000 | 13000 | 1800 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 1.2-2.2 | high terrace | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs1 | SP | 4.4 | <4 | 97 | 51 | 48 | 48 | 240 | 35 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 2.2-2.8 | high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs2 | SP | 3.1 | <4 | 19 | 12 | 11 | 12 | 53 | <10 * | Dow |
| RM-276+00-NE50 | 8/20/2006 | 2.8-4.4 | high terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, single grain, moist, very friable, Non-plastic, single grained to subangular blocky | Bs3 | SP | 6.7 | <4 | 35 | 19 | 18 | 18 | 90 | 14 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 4.4-5.1 | high terrace | 10YR 3/3 dark brown loamy fine sand, moist, single grain, moist, very friable, Non-plastic, single grained parting to subangular blocky, very friable | C1 | SP | 7.5 | <4 | 150 | 51 | 57 | 47 | 300 | 44 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 5.1-6.1 | high terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, loose | C2 | SP | 6.8 | <4 | 48 | 25 | 24 | 21 | 120 | 18 | Dow |
| RM-276+00-NE50 | 8/20/2006 | 6.1-6.6 | high terrace | 10YR 6/6 brownish yellow fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 5.1 | <4 | 12 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-276+00-NE50 | 9/11/2006 | 6.6-7.6 | high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, non-plastic, trace of white shell fragments, < 1mm | C3 | SP | 9.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+00-NE50 | 9/11/2006 | 7.6-8.6 | high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, non-plastic, trace of white shell fragments, < 1mm | C3 | SP | 16.3 | <4 | 25 | 12 | 9 | 10 | 56 | <10 * | Alta |

NOTES:

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Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-NE500 | 8/20/2006 | 0.0-0.7 | low terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SM | 15.7 | 23 | 7500 | 4000 | 3700 | 3700 | 19000 | 2600 | Dow |
| RM-276+00-NE500 | 8/20/2006 | 0.7-1.7 | low terrace | 2.5Y 5/2 grayish brown sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots | 2A/B | SM | 10.4 | 6 | 2900 | 1300 | 1300 | 1200 | 6700 | 920 | Dow |
| RM-276+00-NE500 | 8/20/2006 | 1.7-2.5 | low terrace | 2.5Y 4/3 olive brown loamy sand, moist, subangular blocky, moist, very friable, moderately plastic, loamy sand and sandy loam, 1% fine gravel | Bw | SM | 10.1 | <4 | 2200 | 670 | 820 | 600 | 4300 | 600 | Dow |
| RM-276+00-NE500 | 8/20/2006 | 2.5-4.4 | low terrace | 2.5Y 4/3 olive brown sandy clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, 1% fine to medium gravel | 2C | SC | 13 | <4 | 22 | 7 | 6 | 4 | 40* | <10 * | Dow |
| RM-276+00-NE500 | 9/11/2006 | 4.4-5.4 | low terrace | 10YR 5/1 gray clay loam, common 10YR 5/8 yellowish brown mottle, 15<35% gravel, moist, subangular blocky, moist, firm, moderately plastic, Gravel, 1" diameter - refusal at 6 feet. | 2C2 | ML/CL | 10.5 | <4 | 15 | 7 | 7 | 7 | 37* | <10 * | Dow |
| RM-276+00-NE500 | 9/11/2006 | 5.4-6.0 | low terrace | 10YR 5/1 gray clay loam, common 10YR 5/8 yellowish brown mottle, 15<35% gravel, moist, subangular blocky, moist, firm, moderately plastic, Gravel, 1" diameter - refusal at 6 feet. | 2C2 | ML/CL | 10.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-276+00-NE550 | 8/18/2006 | 0.0-1.0 | high terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, granular, dry, soft, slightly plastic, common fine roots | A | SP | 11.1 | 8 | 2200 | 930 | 800 | 880 | 4800 | 640 | Alta |
| RM-276+00-NE550 | 8/18/2006 | 1.0-1.9 | high terrace | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | E | SP | 8.6 | <4 | 43 | 18 | 15 | 23 | 98 | 15 | Alta |
| RM-276+00-NE550 | 8/18/2006 | 1.9-3.2 | high terrace | 7.5YR 4/6 strong brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | Bs1 | SP | 11 | <4 | 12 | 5 | 5 | 6 | 28* | <10 * | Alta |
| RM-276+00-NE550 | 8/18/2006 | 3.2-4.2 | high terrace | 7.5YR 4/6 strong brown loamy fine sand, moist, single grain, moist, very friable, loose to very friable | Bs2 | SP | 8.4 | <4 | <4 | <6 | <7 | <14 | <35 | <10 | Dow |
| RM-276+00-NE550 | 8/18/2006 | 3.2-4.2 Lab Duplicate | high terrace | 7.5YR 4/6 strong brown loamy fine sand, moist, single grain, moist, very friable, loose to very friable | Bs2 | SP | 8.3 | <4 | <4 | <4 | <4 | <10 | <30 | <10 | Dow |
| RM-276+00-NE550 | 8/18/2006 | 4.2-5.5 | high terrace | 10YR 4/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic | C | SP | 12.3 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-SW220 | 8/30/2006 | 0.0-1.6 | low terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, slightly to moderately plastic, friable to firm | A | SC | 15.6 | 6 | 360 | 200 | 190 | 240 | 1000 | 140 | Dow |
| RM-276+00-SW220 | 8/30/2006 | 1.6-2.6 | low terrace | 2.5Y 5/4 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic | 2C1 | SP | 4.4 | <4 | 15 | 7 | 7 | 9 | 37* | <10 * | Dow |
| RM-276+00-SW220 | 8/30/2006 | 2.6-4.2 | low terrace | 2.5Y 5/4 light olive brown fine sand, few 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few medium and coarse faint mottles | 22 | SP | 2.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-276+00-SW220 | 8/30/2006 | 4.2-4.4 | low terrace | 2.5Y 5/4 light olive brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, sandy loam in thin discontinuous layer. | 2C3 | SP-SC | 9.2 | <4 | 70 | 37 | 37 | 45 | 190 | 27 | Dow |
| RM-276+00-SW220 | 10/23/2006 | 4.4-5.5 | low terrace | 10YR 6/6 brownish yellow sand, moist, single grain, moist, loose, Non-plastic, black particle deposits <0.5 mm diam throughout sample column | 2C4 | SP | 7.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+00-SW220 | 10/23/2006 | 5.5-6.6 | low terrace | 10YR 6/6 brownish yellow sand, wet, single grain, moist, loose, Non-plastic, black particle deposits <0.5 mm diam throughout sample column | 2C4 | SP | 14.7 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+00-SW220 | 10/23/2006 | 6.6-7.7 | low terrace | 5Y 4/3 olive and 10YR 5/6 yellowish brown coarse sand, <15% gravel, wet, granular, moist, loose, Non-plastic, black and copper colored deposits <0.5 mm diam throughout sample gravel from 10-15% vol from 1 mm to >2.5 cm diam | 2C5 | SW | 15.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+00-SW30 | 8/30/2006 | 0.0-1.2 | intermediate terrace | 10YR 4/1 dark gray fine sand, dry, single grain, dry, loose, Non-plastic, common fine roots | A2 | SP | 8.5 | 15 | 6200 | 2000 | 2300 | 1400 | 12000 | 1700 | Dow |
| RM-276+00-SW30 | 8/30/2006 | 1.2-1.7 | intermediate terrace | 10YR 3/1 very dark gray and 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, A horizon intermingled with 10YR 5/4 | A/E | SP | 5.3 | <4 | 710 | 430 | 310 | 200 | 1700 | 220 | Dow |
| RM-276+00-SW30 | 8/30/2006 | 1.7-2.6 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | E | SP | 2.8 | <4 | 56 | 21 | 22 | 17 | 120 | 18 | Dow |
| RM-276+00-SW30 | 8/30/2006 | 2.6-3.8 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy fine sand, dry, subangular blocky, dry, soft, Non-plastic, subangular blocky parting to single grained | B1 | SP | 4.8 | <4 | 65 | 27 | 30 | 22 | 150 | 23 | Dow |
| RM-276+00-SW30 | 8/30/2006 | 3.8-5.2 | intermediate terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, friable, slightly plastic | B2 | SP | 7.3 | <4 | 28 | 11 | 12 | 8 | 60 | 11 | Dow |
| RM-276+00-SW30 | 8/30/2006 | 5.2-5.5 | intermediate terrace | 2.5Y 5/6 light olive brown very fine sand, moist, single grain, moist, loose, Non-plastic | C | SP | 7.3 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-SW310 | 8/30/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | A | SC | 20 | 5 | 27 | 14 | 17 | 18 | 81 | 17 | Dow |
| RM-276+00-SW310 | 8/30/2006 | 0.8-1.3 | high terrace | 10YR 4/2 dark grayish brown loamy fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 2A/E | SP | 6.8 | <4 | 7 | <4 | <4 | <6 | <22 * | <10 * | Dow |
| RM-276+00-SW310 | 8/30/2006 | 1.3-1.9 | high terrace | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | 2E | SP | 3.5 | <5 | <4 | <4 | <4 | 8 | <20 * | <10 * | Dow |
| RM-276+00-SW310 | 8/30/2006 | 1.9-3.3 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown sandy clay, dry, massive, dry, moderately hard, moderately plastic, cemented sandy clay, moderately cemented Horizon - 3Btm | 3Bt | CL | 8.6 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RM-276+00-SW310 | 8/30/2006 | 3.3-4.2 | high terrace | 10YR 4/3 brown fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, weakly cemented | 4C | SC | 5.3 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 0.0-0.4 | low terrace | 10YR 3/2 very dark grayish br very fine sand, moist, granular, moist, very friable, slightly plastic, many very fine roots | A | SM | 20.7 | 13 | 2600 | 1300 | 1200 | 1100 | 6200 | 870 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 0.4-1.4 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, common fine roots | -- | SM | 13 | 23 | 2500 | 1400 | 1400 | 2000 | 7400 | 1000 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 1.4-2.7 | low terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, few fine roots | C1 | SP | 5.7 | 41 | 16000 | 10000 | 8200 | 8000 | 42000 | 5700 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 2.7-3.5 | low terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic, subangular blocky to single grain | C2 | SM | 5 | 37 | 30000 | 12000 | 13000 | 9800 | 65000 | 9200 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 3.5-4.6 | low terrace | 10YR 5/4 yellowish brown fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, Non-plastic, medium faint mottles | C3 | SP | 4.5 | 10 | 4000 | 1800 | 1600 | 1300 | 8700 | 1200 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 4.6-5.9 | low terrace | 10YR 4/4 dark yellowish brown fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, medium faint mottles | C4 | SP | 7.3 | <4 | 470 | 220 | 200 | 180 | 1100 | 150 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 4.6-5.9 Lab Duplicate | low terrace | 10YR 4/4 dark yellowish brown fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, medium faint mottles | C4 | SP | 7.2 | <4 | 640 | 340 | 320 | 240 | 1500 | 220 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 5.9-7.1 | low terrace | 10YR 4/4 dark yellowish brown loamy fine sand, common 7.5YR 5/8 strong brown mottle, moist, single grain, moist, very friable, Non-plastic, common medium faint mottles | C5 | SP | 9.4 | <4 | 360 | 190 | 160 | 150 | 860 | 120 | Dow |
| RM-276+00-SW60 | 8/30/2006 | 7.1-7.7 | low terrace | 10YR 4/1 dark gray sand, wet, single grain, moist, loose, Non-plastic, medium sand and sandy loam - sandy loam subangular blocky, slightly plastic, friable. | Cg6 | SW | 21.2 | <4 | 18 | 4 | 4 | <25 LISR | <41 * | <10 * | Dow |

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|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+00-SW90 | 8/30/2006 | 0.0-0.7 | historic natural levee | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, Non-plastic, common very fine roots | A | SP | 10.1 | <4 | 350 | 170 | 160 | 150 | 830 | 120 | Dow |
| RM-276+00-SW90 | 8/30/2006 | 0.7-1.6 | historic natural levee | 10YR 4/2 dark grayish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, few fine roots, subangular blocky parting to single grain | A/B | SP | 10.2 | <6 | 180 | 96 | 90 | 84 | 460 | 66 | Dow |
| RM-276+00-SW90 | 8/30/2006 | 1.6-2.7 | historic natural levee | 10YR 3/4 dark yellowish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Bt1 | SC | 9.6 | <4 | 46 | 24 | 24 | 17 | 110 | 19 | Dow |
| RM-276+00-SW90 | 8/30/2006 | 2.7-3.3 | historic natural levee | 10YR 3/3 dark brown loamy fine sand, moist, subangular blocky, moist, friable, slightly plastic | Bt2 | SC | 11.9 | <4 | 6 | <4 | <4 | <6 | <22 * | <10 * | Dow |
| RM-276+00-SW90 | 8/30/2006 | 3.3-4.4 | historic natural levee | 2.5Y 5/4 light olive brown very fine sand, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, few fine faint mottles | C | SP | 6.5 | <4 | 5 | <4 | <4 | <7 | <23 * | <10 * | Dow |

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|---|-----------------|-------------------------|--------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+05-NE20 | 10/24/2006 | 0.0-0.5 | natural levee | | 15 | -- | 10.5 | <8 | 10000 | 4300 | 3600 | 3500 | 22000 | 2900 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 0.5-0.9 | natural levee | | 15 | -- | 9.5 | <7 | 3200 | 960 | 820 | 750 | 5700 | 740 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 0.9-1.7 | natural levee | | 15 | -- | 11.1 | 68 | 3500 | 1100 | 980 | 2000 | 7700 | 1000 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 1.7-2.9 | natural levee | | 15 | -- | 3.1 | <8 | 9400 | 4300 | 3000 | 5100 | 22000 | 2700 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 2.9-4.6 | natural levee | | 15 | -- | 0.6 | <7 | 38000 | 20000 | 12000 | 16000 | 86000 | 11000 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 4.6-5.7 | natural levee | | 15 | -- | 2.3 | 23 | 110000 | 48000 | 36000 | 39000 | 230000 | 30000 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 5.7-6.7 | natural levee | | 15 | -- | 6.4 | 10 | 55000 | 21000 | 17000 | 17000 | 110000 | 14000 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 6.7-7.7 | natural levee | | 15 | -- | 4 | <5 | 22000 | 7700 | 6300 | 6200 | 42000 | 5400 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 7.7-8.8 | natural levee | | 15 | -- | 3.3 | 11 | 43000 | 16000 | 14000 | 12000 | 84000 | 11000 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 8.8-9.8 | natural levee | | 15 | -- | 3.3 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+05-NE20 | 10/24/2006 | 9.8-10.8 | natural levee | | 15 | -- | 9.7 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+05-NE20 | 10/24/2006 | 10.8-11.8 | natural levee | | 15 | -- | 22.6 | <4 | 24 | 14 | 13 | 17 | 67 | 12 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 11.8-12.8 | natural levee | | 15 | -- | 9.5 | 7 | 36000 | 13000 | 10000 | 10000 | 70000 | 8900 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 12.8-14.0 | natural levee | | -- | -- | 25.8 | <4 | 1800 | 670 | 550 | 510 | 3600 | 460 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 14.0-15.5 | natural levee | | -- | -- | 39.2 | <4 | 11 | 6 | 5 | 4 | 25* | <10 * | Alta |
| RM-276+05-NE20 | 10/24/2006 | 15.5-16.5 | natural levee | | -- | -- | 18.1 | <4 | 12 | 4 | 4 | <4 | <20 * | <10 * | Alta |
| RM-276+05-NE20 | 10/24/2006 | 16.5-18.4 | natural levee | | -- | -- | 9.2 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-276+05-NE20 | 10/24/2006 | 18.4-18.8 | natural levee | | -- | -- | 52.6 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-276+05-NE20 | 10/24/2006 | 18.8-21.6 | natural levee | | -- | -- | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 21.6-23.4 | natural levee | | -- | -- | 7.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-276+05-NE20 | 10/24/2006 | 23.4-24.0 | natural levee | | -- | -- | 7.5 | <4 | 7 | 4 | 4 | 5 | 20* | <10 * | Alta |
| RM-280+00-NE850 | 11/4/2006 | 0.0-0.8 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 16 | 17 | 3000 | 1200 | 1100 | 920 | 6200 | 830 | Alta |
| RM-280+00-NE850 | 11/4/2006 | 0.8-2.3 | low terrace | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | Bt | ML/CL | 20.7 | <4 | 1000 | 460 | 380 | 390 | 2300 | 300 | Alta |
| RM-280+00-NE850 | 11/4/2006 | 2.3-3.3 | low terrace | 10YR 5/2 grayish brown sandy clay loam, common 10YR 5/8 yellowish brown mottle, wet, granular, moist, friable, moderately plastic | C | ML/CL | 18 | <4 | 190 | 55 | 51 | 36 | 330 | 46 | Alta |
| RM-280+00-T-NE335 | 8/21/2006 | 0.0-0.4 | tributary | 10YR 3/2 very dark grayish br silt loam, moist, subangular blocky, moist, friable, slightly plastic, common fine roots | 1 | ML | 47 | 28 | 1000 | 420 | 360 | 460 | 2300 | 330 | Alta |
| RM-280+00-T-NE335 | 8/21/2006 | 0.4-1.6 | tributary | 10YR 4/2 dark grayish brown silt loam, few mottle, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, Few fine faint mottles | 2 | ML | 34 | 240 | 1500 | 800 | 760 | 1500 | 4800 | 870 | Alta |
| RM-280+00-T-NE335 | 8/21/2006 | 1.6-2.5 | tributary | 10YR 4/2 dark grayish brown silt loam, common mottle, moist, subangular blocky, moist, friable, slightly plastic, Common fine mottles | 3 | ML | 28 | 54 | 1800 | 840 | 910 | 1200 | 4800 | 720 | Dow |
| RM-280+00-T-NE335 | 8/21/2006 | 2.5-3.2 | tributary | 2.5Y 4/2 dark grayish brown silty clay loam, many 5YR 4/6 yellowish red mottle, moist, massive, moist, firm, moderately plastic, Many medium prominent mottles | 4 | CL | 27.2 | <4 | 120 | 54 | 50 | 90 | 310 | 43 | Dow |
| RM-280+00-T-NE80 | 8/21/2006 | 0.0-0.3 | tributary | 10YR 4/2 dark grayish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 1 | SW | 5.2 | 22 | 490 | 200 | 190 | 390 | 1300 | 190 | Alta |
| RM-280+00-T-NE80 | 8/21/2006 | 0.3-1.4 | tributary | 10YR 4/3 brown sand, dry, single grain, dry, loose, Non-plastic, very few fine roots | 2 | SW | 6.6 | 43 | 3000 | 1800 | 1300 | 2200 | 8200 | 1100 | Alta |
| RM-280+00-T-NE80 | 8/21/2006 | 1.4-2.6 | tributary | 10YR 4/4 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | 3 | SP | 7.5 | 18 | 1700 | 710 | 900 | 1400 | 4700 | 680 | Dow |
| RM-280+00-T-NE80 | 8/21/2006 | 2.6-2.9 | tributary | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | 4 | SP | 3.4 | <4 | 1200 | 480 | 550 | 430 | 2700 | 380 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-IC-C | 10/10/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown , moist, single grain, moist, loose, Non-plastic, fine gravel common fine sand very few angular glossy black coarse sand subrounded and subangular grains somewhat well sorted | 1 | GP | 2.4 | <4 | 28 | 12 | 19 | 37 | 96 | 16 | Dow |
| RM-284+00-IC-C | 10/10/2006 | 0.3-0.9 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few coarse sand very few fine gravel very few angular glossy black coarse sand subrounded grains well sorted | 2 | SP | 4.2 | <4 | 32 | 7 | 10 | 9 | 59 | 10 | Dow |
| RM-284+00-IC-C | 10/10/2006 | 0.9-1.6 | in-channel | 10YR 3/1 very dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand very few fine gravel very few angular glossy black coarse sand subrounded grains very few shell fragments | 3 | SM | 16.8 | <4 | 13 | 5 | 6 | 16 | 40* | <10* | Dow |
| RM-284+00-IC-C | 10/10/2006 | 1.6-1.8 | in-channel | 10YR 3/1 very dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few fine gravel few shell fragments very few angular glossy black coarse sand subrounded grains | 4 | SM | 12.4 | <4 | 21 | 7 | 7 | 6 | 41* | <10* | Dow |
| RM-284+00-IC-NE | 10/10/2006 | 0.0-0.8 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand very few fine gravel very few angular glossy black coarse sand well sorted subrounded grains | 1 | SP | 5.8 | <4 | 13 | 5 | 4 | 5 | 27* | <10* | Dow |
| RM-284+00-IC-NE | 10/10/2006 | 0.8-1.3 | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand few coarse sand very few fine gravel few shell fragments very few angular glossy black coarse sand Subrounded grains | 2 | SM | 14 | <4 | 34 | 12 | 14 | 34 | 95 | 15 | Dow |
| RM-284+00-IC-NE | 10/10/2006 | 1.3-1.6 | in-channel | 10YR 2/1 black , many medium roots, Wood/Roots - Saw Dust | 3 | -- | 62.4 | <5 ^{LISR} | 53 | 23 | 20 | 19 | 110 | 18 | Dow |
| RM-284+00-IC-NE | 10/10/2006 | 1.6-1.8 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few medium roots, very few coarse sand few shell fragments subrounded grains | 4 | SM | 34.8 | <4 | <4 | <4 | <6 | <10 | <28 | <10 | Dow |
| RM-284+00-IC-NE | 10/10/2006 | 1.6-1.8 Lab Duplicate | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few medium roots, very few coarse sand few shell fragments subrounded grains | 4 | SM | 37 | <4 | <4 | <4 | <6 | <13 | <31 | <10 | Dow |
| RM-284+00-IC-SW | 10/10/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown , moist, single grain, moist, loose, Non-plastic, Texture - fine gravel common fine sand very few shell fragments subrounded grains somewhat well sorted | 1 | GP | 2.2 | <4 | 59 | 49 | 36 | 100 | 250 | 33 | Dow |
| RM-284+00-IC-SW | 10/10/2006 | 0.3-0.7 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, common coarse sand very few fine gravel very few angular glossy black coarse sand few shell fragments subrounded grains | 2 | SM | 12.5 | <4 | 48 | 16 | 18 | 52 | 130 | 19 | Dow |
| RM-284+00-IC-SW | 10/10/2006 | 0.7-1.5 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine and medium gravel very few angular glossy black coarse sand few shell fragments subrounded and subangular grains | 3 | SM | 10.7 | <4 | 55 | 18 | 18 | 11 | 100 | 16 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE1045 | 8/28/2006 | 0.0-1.0 | high terrace | 10YR 3/2 very dark grayish br loam, moist, moist, friable, slightly plastic, few very fine roots, loam SM/ML | A1 | SM | 14.5 | 9 | 950 | 440 | 440 | 480 | 2300 | 330 | Dow |
| RM-284+00-NE1045 | 8/28/2006 | 1.0-1.8 | high terrace | 10YR 4/2 dark grayish brown sand, moist, moist, loose, Non-plastic | 2A2 | SP | 9.7 | <4 | 140 | 61 | 65 | 53 | 320 | 47 | Dow |
| RM-284+00-NE1045 | 8/28/2006 | 1.8-2.3 | high terrace | 10YR 4/4 dark yellowish brown loamy fine sand, few mottle, moist, moist, loose, Non-plastic, few coarse distinct mottles | 2Bw | SP | 11.7 | <4 | <4 | <4 | <4 | <7 ^{LISR} | <23 | <10 | Dow |
| RM-284+00-NE1045 | 8/28/2006 | 2.3-4.3 | high terrace | 10YR 5/4 yellowish brown sand, few mottle, wet, moist, loose, Non-plastic, few coarse faint mottles | 2C | SW | 13.6 | <4 | 5 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RM-284+00-NE1045 | 9/26/2006 | 4.3-5.4 | high terrace | | -- | -- | 11.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE140 | 8/22/2006 | 0.0-0.2 | high terrace | 10YR 3/2 very dark grayish br loamy very fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots | A | SP | 7 | 11 | 1000 | 540 | 550 | 700 | 2800 | 400 | Dow |
| RM-284+00-NE140 | 8/22/2006 | 0.2-1.6 | high terrace | 10YR 4/3 brown loamy very fine sand, dry, subangular blocky, dry, soft, slightly plastic, loamy very fine sand to very fine sandy loam | Bs1 | SP-SC | 6.7 | 8 | 1600 | 860 | 760 | 890 | 4100 | 560 | Dow |
| RM-284+00-NE140 | 8/22/2006 | 1.6-3.0 | high terrace | 10YR 3/4 dark yellowish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic | Bs2 | SP | 4.3 | <4 | 21 | 20 | 15 | 23 | 80 | 13 | Dow |
| RM-284+00-NE140 | 8/22/2006 | 3.0-4.2 | high terrace | 10YR 4/6 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | Bs3 | SP | 4.2 | <4 | 7 | <4 | 4 | 5 | <20 [*] | <10 [*] | Dow |
| RM-284+00-NE140 | 8/22/2006 | 4.2-5.5 | high terrace | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, slightly plastic, loamy very fine sand to very fine sandy loam | C | SP-SC | 8.7 | <4 | 6 | <6 | 4 | <4 | <22 [*] | <10 [*] | Dow |
| RM-284+00-NE140 | 9/13/2006 | 5.5-6.5 | high terrace | 10YR 4/6 dark yellowish brown silty sand, moist, subangular blocky, firm, moderately plastic, few fine roots, Few, Fine freshwater shells | C | SM | 11.7 | <4 | 4 | <4 | <4 | <4 | <20 [*] | <10 [*] | Alta |
| RM-284+00-NE140 | 9/13/2006 | 6.5-7.8 | high terrace | 10YR 4/6 dark yellowish brown silty sand, moist, subangular blocky, firm, moderately plastic, few fine roots, Few, Fine freshwater shells | C | SM | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE20 | 8/22/2006 | 0.0-0.3 | natural levee | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, Horizon - recent flood deposition | -- | SP | 1 | <4 | 140 | 59 | 61 | 74 | 330 | 46 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 0.0-0.3 Field Duplicate | natural levee | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, Horizon - recent flood deposition | -- | SP | 0.7 | 15 | 1200 | 330 | 360 | 200 | 2100 | 300 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 0.3-1.1 | natural levee | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, common fine roots | C1 | SP | 2.9 | 8 | 1900 | 610 | 680 | 560 | 3700 | 520 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 1.1-2.8 | natural levee | 10YR 3/2 very dark grayish br and 10YR 5/3 brown loamy fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots | C2 | SP | 2.6 | 18 | 2800 | 1200 | 1200 | 1200 | 6400 | 880 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 2.8-3.2 | natural levee | 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C3 | SP | 1.1 | 82 | 33000 | 12000 | 13000 | 9700 | 68000 | 9500 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 3.2-5.4 | natural levee | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 2.4 | 60 | 82000 | 31000 | 30000 | 24000 | 170000 | 23000 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 5.4-6.2 Lab Duplicate | natural levee | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | C5 | SP | 4.1 | 66 | 56000 | 23000 | 30000 | 25000 | 130000 | 20000 | Dow |
| RM-284+00-NE20 | 8/22/2006 | 5.4-6.2 | natural levee | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | C5 | SP | 4.2 | 64 | 43000 | 21000 | 23000 | 17000 | 100000 | 15000 | Dow |
| RM-284+00-NE20 | 9/13/2006 | 6.2-7.4 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Roots, fine to very coarse. Fine to medium mottles (10YR 6/8) at ~9.0'. 10YR 3/2 plant fragment layers (interbedded) from about 10.2-12.3'. Strong brown, common, medium mottles (7.5YR 5/8) from 11.6-12.3'. Moist soil from about 11.1-12.3'. | C7 | SP | 1.2 | 5 | 22000 | 8000 | 8000 | 8400 | 47000 | 6300 | Alta |
| RM-284+00-NE20 | 9/13/2006 | 7.4-8.6 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Roots, fine to very coarse. Fine to medium mottles (10YR 6/8) at ~9.0'. 10YR 3/2 plant fragment layers (interbedded) from about 10.2-12.3'. Strong brown, common, medium mottles (7.5YR 5/8) from 11.6-12.3'. Moist soil from about 11.1-12.3'. | C7 | SP | 6.8 | 8 | 34000 | 15000 | 13000 | 13000 | 75000 | 10000 | Alta |
| RM-284+00-NE20 | 9/13/2006 | 8.6-9.7 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Roots, fine to very coarse. Fine to medium mottles (10YR 6/8) at ~9.0'. 10YR 3/2 plant fragment layers (interbedded) from about 10.2-12.3'. Strong brown, common, medium mottles (7.5YR 5/8) from 11.6-12.3'. Moist soil from about 11.1-12.3'. | C7 | SP | 2.2 | <4 | 18000 | 4200 | 3800 | 3200 | 29000 | 3700 | Alta |
| RM-284+00-NE20 | 9/13/2006 | 9.7-11.1 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Roots, fine to very coarse. Fine to medium mottles (10YR 6/8) at ~9.0'. 10YR 3/2 plant fragment layers (interbedded) from about 10.2-12.3'. Strong brown, common, medium mottles (7.5YR 5/8) from 11.6-12.3'. Moist soil from about 11.1-12.3'. | C7 | SP | 5.2 | <6 | 14000 | 5100 | 4200 | 3700 | 27000 | 3500 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE20 | 9/13/2006 | 11.1-12.3 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Roots, fine to very coarse. Fine to medium mottles (10YR 6/8) at ~9.0'. 10YR 3/2 plant fragment layers (interbedded) from about 10.2-12.3'. Strong brown, common, medium mottles (7.5YR 5/8) from 11.6-12.3'. Moist soil from about 11.1-12.3'. | C7 | SP | 9.3 | <4 | 79 | 11 | 13 | 9 | 110 | 17 | Alta |
| RM-284+00-NE215 | 8/22/2006 | 0.0-0.7 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, moist, friable, Non-plastic, few very fine roots | A | SC | 2.5 | 11 | 2000 | 1200 | 1000 | 1200 | 5300 | 730 | Dow |
| RM-284+00-NE215 | 8/22/2006 | 0.7-1.7 | low terrace | 10YR 4/3 brown sandy clay loam, moist, moist, firm, slightly plastic | Bw | CL | 14.3 | <4 | 510 | 290 | 270 | 290 | 1400 | 190 | Dow |
| RM-284+00-NE215 | 8/22/2006 | 1.7-2.7 | low terrace | 10YR 4/4 dark yellowish brown sandy clay loam, moist, moist, firm, slightly plastic, slightly to moderately plastic | C1 | CL | 16.5 | <4 | 34 | 22 | 20 | 26 | 100 | 16 | Dow |
| RM-284+00-NE215 | 8/22/2006 | 2.7-4.4 | low terrace | 10YR 3/4 dark yellowish brown sandy clay loam, common mottle, moist, moist, firm, moderately plastic, Common fine distinct mottles | C2 | CL | 17.4 | <4 | 9 | <6 | 5 | <14 | <32 * | <10 * | Dow |
| RM-284+00-NE215 | 9/13/2006 | 4.5-5.7 | low terrace | 10YR 4/3 brown sandy loam, few 7.5YR 5/8 strong brown mottle, moist, granular, friable, slightly plastic | C | SM | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE215 | 9/13/2006 | 5.7-6.6 | low terrace | 10Y 6/1 greenish gray clay loam, few 10YR 6/8 brownish yellow mottle, wet, granular, firm, moderately plastic, few roots | C | ML/CL | 17.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE360 | 8/28/2006 | 0.0-0.2 Lab Duplicate | wetland | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, many fine roots, many fine and medium roots and organic material | A | ML | 43.9 | 21 | 2700 | 1500 | 1300 | 1500 | 7100 | 960 | Dow |
| RM-284+00-NE360 | 8/28/2006 | 0.0-0.2 | wetland | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, many fine roots, many fine and medium roots and organic material | A | ML | 44.9 | 24 | 2400 | 1100 | 1100 | 1300 | 5900 | 820 | Dow |
| RM-284+00-NE360 | 8/28/2006 | 0.2-1.2 | wetland | 10YR 4/2 dark grayish brown silt loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic | C1 | ML | 26.1 | 16 | 4200 | 2200 | 2200 | 2400 | 11000 | 1500 | Dow |
| RM-284+00-NE360 | 8/28/2006 | 1.2-2.2 | wetland | 10YR 5/2 grayish brown silty clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C2 | ML/CL | 22.4 | <4 | 440 | 220 | 200 | 180 | 1000 | 140 | Dow |
| RM-284+00-NE360 | 8/28/2006 | 2.2-4.1 | wetland | 10YR 2/1 black , wet, black organic, buried peat layer, no structure, no texture | -- | PT | 58.7 | <4 | 520 | 240 | 490 | 210 | 1400 | 250 | Dow |
| RM-284+00-NE360 | 8/28/2006 | 4.1-4.5 | wetland | 2.5Y 3/1 very dark gray sand, wet, single grain, moist, loose, Non-plastic, no horizon - below soil profile | -- | SP | 26.4 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-NE360 | 9/26/2006 | 4.5-5.8 | wetland | | -- | -- | 24.8 | <4 | 150 | 80 | 60 | 61 | 350 | 48 | Alta |
| RM-284+00-NE360 | 9/26/2006 | 5.8-6.3 | wetland | | -- | -- | 17.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE40 | 8/22/2006 | 0.0-0.3 | intermediate terrace | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, many fine roots, horizon - recent flood deposits | -- | SP | 4.4 | 5 | 1100 | 480 | 510 | 520 | 2700 | 370 | Dow |
| RM-284+00-NE40 | 8/22/2006 | 0.3-1.5 | intermediate terrace | 10YR 4/3 brown loamy fine sand, dry, subangular blocky, dry, soft, Non-plastic, common fine roots, non-plastic to slightly plastic, thin sandy layer | C1 | SP | 5.6 | 43 | 6800 | 1900 | 2000 | 1900 | 13000 | 1700 | Dow |
| RM-284+00-NE40 | 8/22/2006 | 1.5-2.9 | intermediate terrace | 10YR 6/3 pale brown fine sand, moist, subangular blocky, moist, loose, Non-plastic, a couple of thin laterals of loamy fine sand | C2 | SP | 3 | | 5600 | 3900 | 3600 | 5900 | 19000 | 2600 | Dow |
| RM-284+00-NE40 | 8/22/2006 | 2.9-4.0 | intermediate terrace | 10YR 4/2 dark grayish brown sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C3 | SC | 6.8 | 31 | 22000 | 11000 | 11000 | 9700 | 54000 | 7600 | Dow |
| RM-284+00-NE40 | 8/22/2006 | 4.0-5.7 | intermediate terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin interbeds of 10 YR 4/3 brown loamy fine sand | C4 | SP | 2.8 | 9 | 6500 | 2400 | 2400 | 1700 | 13000 | 1800 | Dow |
| RM-284+00-NE40 | 9/13/2006 | 5.7-6.8 | intermediate terrace | 10YR 6/3 pale brown fine sand, common 10YR 6/8 brownish yellow and 7.5YR 5/8 strong brown mottle, dry, single grain, dry, loose, Non-plastic, few fine roots, Fine to medium mottles. 10YR 3/2 very dark grayish brown plant fragment layers at 6.2-6.4', 7.7-8.0', and 8.8-9.1'. 10YR 3/3, dark brown layers at 7.7-8.0' and 8.3-8.6', moist, slightly plastic, granular | 6 | SP | 4.2 | <4 | 260 | 100 | 89 | 100 | 550 | 74 | Alta |
| RM-284+00-NE40 | 9/13/2006 | 6.8-8.0 | intermediate terrace | 10YR 6/3 pale brown fine sand, common 10YR 6/8 brownish yellow and 7.5YR 5/8 strong brown mottle, dry, single grain, dry, loose, Non-plastic, few fine roots, Fine to medium mottles. 10YR 3/2 very dark grayish brown plant fragment layers at 6.2-6.4', 7.7-8.0', and 8.8-9.1'. 10YR 3/3, dark brown layers at 7.7-8.0' and 8.3-8.6', moist, slightly plastic, granular | 6 | SP | 4.2 | <4 | 780 | 670 | 400 | 780 | 2600 | 330 | Alta |
| RM-284+00-NE40 | 9/13/2006 | 8.0-9.8 | intermediate terrace | 10YR 6/3 pale brown fine sand, common 10YR 6/8 brownish yellow and 7.5YR 5/8 strong brown mottle, dry, single grain, dry, loose, Non-plastic, few fine roots, Fine to medium mottles. 10YR 3/2 very dark grayish brown plant fragment layers at 6.2-6.4', 7.7-8.0', and 8.8-9.1'. 10YR 3/3, dark brown layers at 7.7-8.0' and 8.3-8.6', moist, slightly plastic, granular | 6 | SP | 11.4 | <4 | 1400 | 390 | 400 | 430 | 2600 | 350 | Alta |
| RM-284+00-NE40 | 9/13/2006 | 9.8-10.3 | intermediate terrace | 10YR 2/2 very dark brown clay loam, wet, moist, firm, moderately plastic, Plant fragments. | 6 | ML/CL | 27.8 | <4 | 14 | 5 | 5 | 5 | 29* | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE450 | 8/28/2006 | 0.0-0.6 | low terrace | 10YR 4/2 dark grayish brown loam, moist, subangular blocky, moist, firm, moderately plastic, few very fine roots, loam SL/ML | A | ML | 18.5 | <4 | 1300 | 530 | 570 | 610 | 3000 | 410 | Dow |
| RM-284+00-NE450 | 8/28/2006 | 0.6-0.8 | low terrace | 10YR 4/3 brown sandy loam, few mottle, moist, subangular blocky, moist, friable, slightly plastic, few medium faint mottles | A/B | SC | 11.6 | <4 | 84 | 44 | 41 | 49 | 220 | 31 | Dow |
| RM-284+00-NE450 | 8/28/2006 | 0.8-1.8 | low terrace | 7.5YR 4/6 strong brown sandy clay loam, common mottle, moist, subangular blocky, moist, firm, moderately plastic, common medium distinct mottles | Bs1 | CL | 14.1 | <4 | 54 | 23 | 26 | 22 | 120 | 20 | Dow |
| RM-284+00-NE450 | 8/28/2006 | 1.8-2.5 | low terrace | 10YR 4/6 dark yellowish brown sandy clay loam, common mottle, moist, subangular blocky, moist, firm, moderately plastic, common medium distinct mottles | Bs2 | CL | 14.1 | <4 | 54 | 25 | 26 | 24 | 130 | 19 | Dow |
| RM-284+00-NE450 | 8/28/2006 | 2.5-3.3 | low terrace | 10YR 4/3 brown sandy clay loam, common mottle, moist, subangular blocky, moist, firm, moderately plastic, common medium distinct mottles | C | CL | 14.4 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-NE450 | 9/26/2006 | 3.3-4.0 | low terrace | | -- | -- | 10.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE510 | 8/28/2006 | 0.0-1.5 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, few very fine roots, loam SM/ML | A | SM | 3.4 | 9 | 1000 | 510 | 480 | 530 | 2500 | 350 | Dow |
| RM-284+00-NE510 | 8/28/2006 | 1.5-1.9 | high terrace | 10YR 4/2 dark grayish brown loamy very fine sand, moist, single grain, moist, friable, Non-plastic, single grained to subangular blocky | 2A/E | SP | 9.8 | <4 | 120 | 56 | 58 | 45 | 280 | 39 | Dow |
| RM-284+00-NE510 | 8/28/2006 | 1.9-2.6 | high terrace | 2.5Y 6/3 light yellowish brow very fine sand, moist, single grain, moist, loose, Non-plastic, single grained to subangular blocky, loose to very friable | 2E | SP | 8.4 | <4 | 46 | 21 | 23 | 18 | 110 | 16 | Dow |
| RM-284+00-NE510 | 8/28/2006 | 2.6-3.3 | high terrace | 10YR 4/6 dark yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic | 2Bs1 | SW | 10.5 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-NE510 | 8/28/2006 | 3.3-4.1 | high terrace | 10YR 4/4 dark yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic | 2Bs2 | SW | 10 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-NE510 | 8/28/2006 | 4.1-4.4 | high terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic | 2C | SP | 9.8 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-NE510 | 9/26/2006 | 4.4-5.4 | high terrace | | -- | -- | <4 | 11 | <4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-284+00-NE510 | 9/26/2006 | 5.4-6.2 | high terrace | | -- | -- | <4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE510 | 9/26/2006 | 6.2-6.5 | high terrace | | -- | -- | <4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE55 | 8/22/2006 | 0.0-0.2 | high terrace | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic, horizon - recent flood plain deposits | -- | SP | 1.4 | <4 | 230 | 93 | 100 | 98 | 530 | 75 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 0.2-0.8 | high terrace | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown loamy fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots, horizon - flood deposits, alternating 10yr 4/2 - loamy fine sand and 10yr 6/3 - fine sand, roots found in loamy fine sand | -- | SP | 3.7 | 11 | 2200 | 880 | 810 | 690 | 4600 | 630 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 0.8-1.2 | high terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, single grain, dry, loose, Non-plastic, common very fine roots | Ab | SP | 7.4 | 33 | 2800 | 1400 | 1300 | 1400 | 7000 | 980 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 1.2-2.5 | high terrace | 10YR 6/3 pale brown fine sand, dry, single grain, dry, loose, Non-plastic | C1 | SP | 1.2 | 8 | 1200 | 660 | 760 | 1300 | 4000 | 560 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 2.5-3.4 | high terrace | 10YR 4/2 dark grayish brown loamy fine sand, dry, single grain, dry, loose, Non-plastic, single grained to subangular blocky, loose to soft | C2 | SP | 4.9 | 14 | 12000 | 4400 | 4900 | 4300 | 26000 | 3600 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 3.4-4.6 | high terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, two thin (0.05 - 0.1) layers of loamy fine sand | C3 | SP | 2.1 | 56 | 50000 | 22000 | 21000 | 17000 | 110000 | 15000 | Dow |
| RM-284+00-NE55 | 8/22/2006 | 4.6-6.4 | high terrace | 10YR 4/2 dark grayish brown and 10YR 6/3 pale brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, alternating layers of 10 YR 4/2 and 10 YR 6/3, single grained to subangular blocky, loose to very friable | C4 | SP | 5.8 | 46 | 65000 | 15000 | 24000 | 18000 | 120000 | 17000 | Dow |
| RM-284+00-NE55 | 9/13/2006 | 6.4-7.6 | high terrace | 10YR 6/3 pale brown , common 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, fewroots, Mottles turn to medium below 8.5', 10YR 3/2 very dark grayish brown plant fragment layers from 8.4'-8.6', 9.1'-9.2', 10.2'-10.9'. 10YR 3/3 dark brown loam, silty sand (SM) layers at 6.9'-7.1', 8.0'-8.4', 9.6'-9.8', 10.8'-10.9', granular, slightly plastic, firm | C | SP | 1.5 | <4 | 1800 | 550 | 470 | 480 | 3300 | 420 | Alta |
| RM-284+00-NE55 | 9/13/2006 | 7.6-8.6 | high terrace | 10YR 6/3 pale brown , common 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, fewroots, Mottles turn to medium below 8.5', 10YR 3/2 very dark grayish brown plant fragment layers from 8.4'-8.6', 9.1'-9.2', 10.2'-10.9'. 10YR 3/3 dark brown loam, silty sand (SM) layers at 6.9'-7.1', 8.0'-8.4', 9.6'-9.8', 10.8'-10.9', granular, slightly plastic, firm | C | SP | 4 | <4 | 1200 | 340 | 310 | 250 | 2100 | 270 | Alta |
| RM-284+00-NE55 | 9/13/2006 | 8.6-9.8 | high terrace | 10YR 6/3 pale brown , common 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, fewroots, Mottles turn to medium below 8.5', 10YR 3/2 very dark grayish brown plant fragment layers from 8.4'-8.6', 9.1'-9.2', 10.2'-10.9'. 10YR 3/3 dark brown loam, silty sand (SM) layers at 6.9'-7.1', 8.0'-8.4', 9.6'-9.8', 10.8'-10.9', granular, slightly plastic, firm | C | SP | 4.4 | <4 | 110 | 28 | 26 | 19 | 180 | 26 | Alta |
| RM-284+00-NE55 | 9/13/2006 | 9.8-10.9 | high terrace | 10YR 6/3 pale brown , common 10YR 6/8 brownish yellow mottle, dry, single grain, dry, loose, Non-plastic, fewroots, Mottles turn to medium below 8.5', 10YR 3/2 very dark grayish brown plant fragment layers from 8.4'-8.6', 9.1'-9.2', 10.2'-10.9'. 10YR 3/3 dark brown loam, silty sand (SM) layers at 6.9'-7.1', 8.0'-8.4', 9.6'-9.8', 10.8'-10.9', granular, slightly plastic, firm | C | SP | 7.6 | <4 | 14 | 6 | 5 | 6 | 30* | <10 * | Alta |

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Midland, Michigan

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|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-NE90 | 8/22/2006 | 0.0-0.3 | historic natural levee | 10YR 3/2 very dark grayish br fine sand, dry, single grain, dry, loose, Non-plastic | A | SP | 3.4 | 9 | 3300 | 1700 | 1700 | 2000 | 8800 | 1200 | Dow |
| RM-284+00-NE90 | 8/22/2006 | 0.3-1.2 | historic natural levee | 10YR 4/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic | A/C | SP | 5.5 | | 7300 | 7300 | 6500 | 6300 | 27000 | 3900 | Dow |
| RM-284+00-NE90 | 8/22/2006 | 1.2-2.2 | historic natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 5 | <4 | 970 | 500 | 450 | 480 | 2400 | 330 | Dow |
| RM-284+00-NE90 | 8/22/2006 | 2.2-3.1 | historic natural levee | 10YR 4/3 brown very fine sand, moist, single grain, moist, loose, Non-plastic, small freshwater shells | C2 | SP | 4.4 | <4 | 620 | 280 | 300 | 300 | 1500 | 210 | Dow |
| RM-284+00-NE90 | 8/22/2006 | 3.1-4.4 | historic natural levee | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, larger freshwater shells | C3 | SP | 6.6 | <4 | 110 | 46 | 59 | 69 | 280 | 43 | Dow |
| RM-284+00-NE90 | 8/22/2006 | 4.4-5.5 | historic natural levee | 10YR 4/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 7.9 | <4 | 99 | 46 | 55 | 64 | 260 | 40 | Dow |
| RM-284+00-NE90 | 9/13/2006 | 5.5-6.6 | historic natural levee | 10YR 5/6 yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic, few roots, few fine and medium white freshwater shells | C | SM | 6.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-NE90 | 9/13/2006 | 6.6-7.7 | historic natural levee | 10YR 5/6 yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic, few roots, few fine and medium white freshwater shells | C | SM | 6.9 | <4 | 9 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RM-284+00-NE90 | 9/13/2006 | 7.7-8.8 | historic natural levee | 10YR 5/6 yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic, few roots, fine sand layer at 8.2 - 8.4, poorly graded sand (SP) single grain, loose, non plastic | C | SM | 6.3 | <4 | 11 | 5 | 5 | 7 | 28* | <10 * | Alta |
| RM-284+00-SW125 | 8/31/2006 | 0.0-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, few fine roots | A | SM | 24.6 | 37 | 2400 | 1200 | 980 | 1700 | 6300 | 850 | Alta |
| RM-284+00-SW125 | 8/31/2006 | 1.2-1.7 | low terrace | 10YR 4/3 brown loamy fine sand, moist, subangular blocky, moist, friable, slightly plastic | Bw | SM | 11.7 | <4 | 5400 | 2100 | 1800 | 1600 | 11000 | 1400 | Alta |
| RM-284+00-SW125 | 8/31/2006 | 1.7-3.9 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C1 | SM | 12.9 | <4 | 54 | 26 | 21 | 33 | 140 | 20 | Alta |
| RM-284+00-SW125 | 8/31/2006 | 3.9-5.0 | low terrace | 10YR 4/2 dark grayish brown very fine sandy loam, common mottle, moist, subangular blocky, moist, friable, slightly plastic, common medium distinct mottles | C2 | SM | 17.7 | <4 | 89 | 34 | 30 | 30 | 180 | 26 | Alta |
| RM-284+00-SW125 | 8/31/2006 | 5.0-6.0 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, few medium distinct mottles | C3 | SM | 14.1 | <4 | 14 | 9 | 7 | 10 | 39* | <10 * | Alta |
| RM-284+00-SW125 | 8/31/2006 | 6.0-6.6 | low terrace | 10YR 4/1 dark gray sandy loam, moist, angular blocky, moist, friable, slightly plastic, friable to firm | C4 | SM | 18.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-SW170 | 8/31/2006 | 0.0-0.5 | wetland | 10YR 3/2 very dark grayish br loam, dry, moist, friable, slightly plastic, few very fine roots, slightly to moderately plastic | A | SC | 20.8 | 29 | 600 | 230 | 230 | 440 | 1500 | 230 | Alta |
| RM-284+00-SW170 | 8/31/2006 | 0.5-1.4 | wetland | 10YR 3/3 dark brown silty clay loam, moist, moist, firm, moderately plastic, few fine roots | Bw | CL | 24.1 | <4 | 310 | 130 | 110 | 120 | 670 | 89 | Alta |
| RM-284+00-SW170 | 8/31/2006 | 1.4-2.5 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, moist, firm, slightly plastic, common fine distinct mottles approx 2-5% fine gravel | C1 | CL | 14.1 | <4 | 14 | 7 | 6 | 9 | 36* | <10 * | Alta |
| RM-284+00-SW170 | 8/31/2006 | 2.5-4.2 | wetland | 10YR 4/2 dark grayish brown silty clay loam, many 10YR 5/8 yellowish brown mottle, moist, moist, firm, slightly plastic, many fine distinct mottles approx. 5% fine gravel | C2 | CL | 10.9 | <4 | 25 | 13 | 11 | 18 | 67 | 11 | Alta |
| RM-284+00-SW170 | 10/20/2006 | 4.2-5.3 | wetland | 10YR 4/2 dark grayish brown silty clay, many 10YR 5/8 yellowish brown mottle, wet, moist, very firm, moderately plastic, many fine distinct mottles approx. 5% fine gravel trace white freshwater snail shells perched water at 4.2 ft | C2 | CL | 15.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RM-284+00-SW205 | 8/31/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots, few fine and very fine roots | A | SC | 11.3 | <4 | 7 | <4 | <4 | 7 | <20 * | <10 * | Alta |
| RM-284+00-SW205 | 8/31/2006 | 0.8-1.7 | high terrace | 10YR 4/6 dark yellowish brown sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic | Bt | CL | 11.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-SW205 | 8/31/2006 | 1.7-3.2 | high terrace | 10YR 4/3 brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, friable to firm 5-15% fine and medium gravel | C | SC | 13.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-SW30 | 8/31/2006 | 0.0-0.7 | natural levee | 10YR 3/1 very dark gray fine sandy loam, dry, granular, dry, soft, Non-plastic, common fine roots | A | SM | 16.3 | 43 | 7400 | 2900 | 2400 | 3100 | 16000 | 2100 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 0.7-1.9 | natural levee | 10YR 4/2 dark grayish brown loamy fine sand, dry, granular, dry, loose, Non-plastic, Granular to single grain | A/E | SP | 7.4 | <11 | 22000 | 10000 | 8300 | 8400 | 49000 | 6400 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 1.9-2.8 | natural levee | 10YR 6/2 light brownish gray fine sand, dry, single grain, dry, loose, Non-plastic | E | SP | 5.9 | <8 | 8500 | 3500 | 3000 | 2800 | 18000 | 2400 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 2.8-3.7 | natural levee | 10YR 4/4 dark yellowish brown fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | Bt1 | SC | 9.9 | <4 | 2500 | 1300 | 990 | 970 | 5800 | 760 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 3.7-5.3 | natural levee | 10YR 4/6 dark yellowish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Bt2 | SC | 10.5 | <4 | 130 | 52 | 45 | 45 | 270 | 38 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 5.3-7.2 | natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, fresh water shells | C1 | SP | 11.3 | <4 | 31 | 13 | 12 | 14 | 70 | 11 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 7.2-8.8 | natural levee | 10YR 5/4 yellowish brown loamy very fine sand, common mottle, moist, subangular blocky, moist, very friable, Non-plastic, common medium distinct mottles | C2 | SP | 13.9 | <4 | 160 | 62 | 57 | 78 | 360 | 49 | Alta |
| RM-284+00-SW30 | 8/31/2006 | 8.8-9.9 | natural levee | 10YR 5/3 brown loamy very fine sand, common mottle, moist, subangular blocky, moist, very friable, slightly plastic, Common medium distinct mottles | C3 | SM | 14.3 | <4 | 330 | 140 | 110 | 150 | 720 | 94 | Alta |
| RM-284+00-SW30 | 10/20/2006 | 9.9-11.0 | natural levee | 10YR 5/2 grayish brown loamy sand, wet, granular, moist, friable, slightly plastic, Trace white freshwater snail shells | C4 | SM | 20.3 | <4 | 10 | 4 | 4 | <4 | <20 * | <10 * | Dow |
| RM-284+00-SW55 | 8/31/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/1 very dark gray loam, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots, SM/ML | A | SM | 23.4 | 46 | 6200 | 2700 | 2100 | 2800 | 14000 | 1800 | Alta |
| RM-284+00-SW55 | 8/31/2006 | 0.3-1.4 | intermediate terrace | 10YR 4/3 brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, few fine roots | Bw | SM | 25.6 | 13 | 9500 | 3400 | 2500 | 2300 | 18000 | 2300 | Alta |
| RM-284+00-SW55 | 8/31/2006 | 1.4-2.5 | intermediate terrace | 10YR 5/4 yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, Non-plastic | C1 | SP | 9.9 | <4 | 190 | 85 | 70 | 90 | 430 | 59 | Alta |
| RM-284+00-SW55 | 8/31/2006 | 2.5-3.7 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, Non-plastic, subangular blocky parting single grained few fine faint mottles | C2 | SP | 13.7 | <4 | 190 | 88 | 69 | 95 | 450 | 60 | Alta |
| RM-284+00-SW55 | 8/31/2006 | 3.7-4.8 | intermediate terrace | 10YR 4/4 dark yellowish brown very fine sand, few mottle, moist, single grain, moist, loose, Non-plastic, few medium faint mottles | C3 | SP | 13.8 | <4 | 9 | 4 | <4 | 5 | <20 * | <10 * | Alta |
| RM-284+00-SW55 | 8/31/2006 | 4.8-6.1 | intermediate terrace | 10YR 4/4 dark yellowish brown very fine sand, common mottle, moist, single grain, moist, loose, Non-plastic, Common medium faint mottles | C4 | SP | 10.9 | <4 | 11 | 5 | 4 | 5 | 25* | <10 * | Alta |
| RM-284+00-SW55 | 8/31/2006 | 6.1-6.6 | intermediate terrace | 10YR 4/2 dark grayish brown loamy very fine sand, common mottle, moist, single grain, moist, loose, Non-plastic, Common coarse distinct mottles | C5 | SP | 15 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+00-SW60 | 8/31/2006 | 0.0-0.8 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | A | SM | 21.5 | 21 | 1300 | 700 | 530 | 860 | 3400 | 450 | Alta |
| RM-284+00-SW60 | 8/31/2006 | 0.8-2.3 | high terrace | 10YR 2/2 very dark brown fine sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots, granular to subangular blocky | Bt1 | SM | 19.8 | <4 | 240 | 110 | 84 | 120 | 560 | 74 | Alta |
| RM-284+00-SW60 | 8/31/2006 | 2.3-3.7 | high terrace | 10YR 4/6 dark yellowish brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Bt2 | SM | 10.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-SW60 | 8/31/2006 | 3.7-4.7 | high terrace | 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic | C1 | SP | 9.8 | <4 | 28 | 12 | 11 | 16 | 65 | 11* | Alta |
| RM-284+00-SW60 | 8/31/2006 | 4.7-6.1 | high terrace | 10YR 4/3 brown loamy fine sand, common mottle, moist, subangular blocky, moist, very friable, Non-plastic, common coarse faint mottles | C2 | SP | 9.2 | <4 | 11 | 5 | 4 | 7 | 27* | <10* | Alta |
| RM-284+00-SW60 | 8/31/2006 | 6.1-6.6 | high terrace | 10YR 4/2 dark grayish brown loamy fine sand, few mottle, moist, subangular blocky, moist, very friable, slightly plastic, few coarse faint mottles subangular blocky to single grain | C3 | SP | 13.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+00-SW60 | 8/31/2006 | 6.6-7.7 | high terrace | 10YR 4/2 dark grayish brown loamy fine sand, few mottle, moist, subangular blocky, moist, friable, slightly plastic, interbedded loamy fine sand and silty clay loam slightly plastic to moderately plastic very friable to firm very few coarse faint mottles | C4 | SP | 16.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

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|---|-----------------|-------------------------|--------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+05-NE20 | 10/22/2006 | 0.0-0.3 | natural levee | | 7 | -- | 4.7 | <4 | 260 | 100 | 96 | 95 | 550 | 76 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 0.3-1.1 | natural levee | | 7 | -- | 11.6 | 8 | 6300 | 2200 | 2400 | 1400 | 12000 | 1700 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 1.1-2.8 | natural levee | | 7 | -- | 9.1 | 110 | 4100 | 2200 | 1800 | 2300 | 11000 | 1500 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 2.8-3.2 | natural levee | | 7 | -- | 3.7 | 40 | 1600 | 680 | 690 | 1100 | 4100 | 590 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 3.2-5.4 | natural levee | | 7 | -- | 2.4 | 6 | 18000 | 8000 | 8700 | 8400 | 43000 | 6000 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 5.4-6.2 | natural levee | | 7 | -- | 2.7 | 31 | 66000 | 24000 | 24000 | 16000 | 130000 | 18000 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 6.2-7.4 | natural levee | | 7 | -- | 2.6 | 51 | 70000 | 24000 | 29000 | 19000 | 140000 | 20000 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 7.4-8.6 | natural levee | | 7 | -- | 5.5 | 41 | 56000 | 19000 | 22000 | 17000 | 110000 | 16000 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 8.6-9.7 | natural levee | | 7 | -- | 5 | 7 | 7700 | 2600 | 2700 | 1800 | 15000 | 2000 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 9.7-11.1 | natural levee | | 7 | -- | 14.4 | <4 | 1100 | 370 | 390 | 310 | 2200 | 300 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 11.1-12.3 | natural levee | | 7 | -- | 28.7 | <4 | 60 | 27 | 24 | 21 | 130 | 20 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 12.3-12.5 | natural levee | | 7 | -- | 14.4 | <4 | 89 | 41 | 38 | 31 | 200 | 29 | Dow |
| RM-284+05-NE20 | 10/22/2006 | 12.5-15.0 | natural levee | | -- | -- | 28.3 | <4 | 7 | 4 | 4 | 4 | <20 * | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

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|---|-----------------|-------------------------|----------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+05-NE40 | 10/24/2006 | 0.0-0.3 | intermediate terrace | | 8 | -- | 14 | <11 | 4700 | 1700 | 1300 | 1400 | 9100 | 1200 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 0.3-1.5 | intermediate terrace | | 8 | -- | 16.4 | 57 | 2100 | 910 | 760 | 1400 | 5300 | 730 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 1.5-2.9 | intermediate terrace | | 8 | -- | 3.4 | 37 | 16000 | 4800 | 6100 | 7500 | 35000 | 4800 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 2.9-4.0 | intermediate terrace | | 8 | -- | 8.3 | <7 | 12000 | 6600 | 4900 | 6700 | 30000 | 3900 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 4.0-5.7 | intermediate terrace | | 8 | -- | 5.5 | <7 | 29000 | 13000 | 10000 | 10000 | 63000 | 8200 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 5.7-6.8 | intermediate terrace | | 8 | -- | 2.7 | <4 | 260 | 75 | 67 | 63 | 470 | 63 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 6.8-8.0 | intermediate terrace | | 8 | -- | 4.1 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-284+05-NE40 | 10/24/2006 | 8.0-9.8 | intermediate terrace | | 8 | -- | 12.6 | <6 | 4200 | 1700 | 1400 | 1500 | 8700 | 1100 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 9.8-10.3 | intermediate terrace | | 8 | -- | 26.4 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-284+05-NE40 | 10/24/2006 | 10.3-11.2 | intermediate terrace | | -- | -- | 26.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-284+05-NE40 | 10/24/2006 | 11.2-12.0 | intermediate terrace | | -- | -- | 28 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Midland, Michigan

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|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-284+05-NE55 | 10/24/2006 | 0.0-0.2 | high terrace | | 34 | -- | 8 | <4 | 260 | 94 | 83 | 140 | 580 | 78 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 0.2-0.8 | high terrace | | 34 | -- | 10.7 | 11 | 1800 | 730 | 730 | 710 | 4000 | 560 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 0.8-1.2 | high terrace | | 34 | -- | 17.3 | 80 | 1500 | 720 | 600 | 1300 | 4200 | 620 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 1.2-2.5 | high terrace | | 34 | -- | 7.1 | 12 | 1400 | 750 | 580 | 1200 | 3900 | 510 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 2.5-3.4 | high terrace | | 34 | -- | 4.2 | <7 | 8200 | 3200 | 2500 | 2800 | 17000 | 2200 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 3.4-4.6 | high terrace | | 34 | -- | 5.6 | 9 | 10000 | 4000 | 3300 | 3000 | 21000 | 2700 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 4.6-6.4 | high terrace | | 34 | -- | 3.4 | 46 | 180000 | 49000 | 52000 | 37000 | 320000 | 43000 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 6.4-7.6 | high terrace | | 34 | -- | 2.2 | 4 | 14000 | 7000 | 5600 | 5200 | 32000 | 4200 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 7.6-8.6 | high terrace | | 34 | -- | 2.7 | 6 | 39000 | 15000 | 12000 | 9900 | 75000 | 9900 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 8.6-9.8 | high terrace | | 34 | -- | 3.6 | <4 | 5100 | 2100 | 1700 | 1500 | 10000 | 1300 | Alta |
| RM-284+05-NE55 | 10/24/2006 | 10.9-12.0 | high terrace | | -- | -- | 18.5 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-285+50-NE1050 | 11/4/2006 | 0.0-1.6 | high terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 14.5 | 6 | 720 | 420 | 330 | 440 | 1900 | 260 | Alta |
| RM-285+50-NE1050 | 11/4/2006 | 1.6-2.9 | high terrace | 2.5Y 4/2 dark grayish brown loamy sand, few 2.5Y 5/6 light olive brown mottle, moist, granular, moist, friable, slightly plastic, few fine roots, 60% recovery | C1 | SW | 9.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-285+50-NE1050 | 11/4/2006 | 2.9-4.4 | high terrace | 2.5Y 5/3 light olive brown coarse sand, wet, single grain, moist, loose, Non-plastic, few fine roots, white freshwater shells 50% recovery | C2 | SP | 14.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Upper Tittabawassee River: Reach M

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RM-285+50-NE550 | 11/4/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | SM | 16.1 | <4 | 520 | 240 | 210 | 250 | 1200 | 160 | Alta |
| RM-285+50-NE550 | 11/4/2006 | 0.0-0.8 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | SM | 15.8 | 6 | 520 | 270 | 220 | 280 | 1300 | 180 | Alta |
| RM-285+50-NE550 | 11/4/2006 | 0.8-1.7 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 12.2 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-285+50-NE550 | 11/4/2006 | 1.7-3.5 | high terrace | 7.5YR 4/4 brown sandy clay loam, wet, granular, moist, friable, moderately plastic | C2 | SM | 15.4 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RM-285+50-NE550 | 11/4/2006 | 3.5-4.0 | high terrace | 7.5YR 4/4 brown fine sand, wet, single grain, moist, loose, Non-plastic | C3 | SP | 12.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RM-285+50-NE550 | 11/4/2006 | 4.0-4.4 | high terrace | 7.5YR 4/4 brown fine sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic | C4 | SP | 8.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

"LSV" indicates elevated reporting limit due to limited sample volume.

"LISR" indicates elevated reporting limit due to low internal standard recovery.

"MI" indicates elevated reporting limit due to matrix interference.

"SL" indicates sample lost during laboratory analysis.



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Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-288+00-NE100 | 11/4/2006 | 0.0-0.7 | historic natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 20.9 | 20 | 1100 | 600 | 510 | 730 | 2900 | 410 | Alta |
| RN-288+00-NE100 | 11/4/2006 | 0.0-0.7 Field Duplicate | historic natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 20.7 | 22 | 1300 | 760 | 630 | 850 | 3600 | 500 | Alta |
| RN-288+00-NE100 | 11/4/2006 | 0.7-2.2 | historic natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 8.3 | <4 | 140 | 71 | 61 | 74 | 350 | 48 | Alta |
| RN-288+00-NE100 | 11/4/2006 | 2.2-3.3 | historic natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | 2Ab | SM | 17.6 | <4 | 8 | 4 | 4 | 5 | 21* | <10* | Alta |
| RN-288+00-NE100 | 11/4/2006 | 3.3-4.0 | historic natural levee | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | AC | SM | 13.2 | <4 | 91 | 44 | 37 | 52 | 220 | 31 | Alta |
| RN-288+00-NE100 | 11/4/2006 | 4.0-5.5 | historic natural levee | 10YR 5/6 yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, white freshwater shells | 2C2 | SM | 8.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 0.0-0.5 | natural levee | 10YR 2/1 black loamy fine sand, moist, granular, moist, very friable, Non-plastic, common fine roots | A5 | SP-SM | 22 | 32 | 1500 | 650 | 610 | 960 | 3700 | 530 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 0.0-0.5 Field Duplicate | natural levee | 10YR 2/1 black loamy fine sand, moist, granular, moist, very friable, Non-plastic, common fine roots | A5 | SP-SM | 19.5 | 31 | 1700 | 890 | 790 | 1300 | 4600 | 640 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 0.5-2.0 | natural levee | 10YR 4/3 brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 6.7 | 6 | 3900 | 1200 | 1100 | 1200 | 7300 | 960 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 2.0-3.5 | natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 10.3 | <4 | 110 | 42 | 42 | 47 | 240 | 35 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 3.5-4.5 | natural levee | 10YR 3/3 dark brown loam, dry, angular blocky, weak, dry, moderately hard, moderately plastic | C3 | ML/CL | 17 | <4 | 19 | 8 | 9 | 16 | 52 | <10* | Alta |
| RN-288+00-SW30 | 11/6/2006 | 4.5-5.7 | natural levee | 10YR 3/3 dark brown fine sandy loam, dry, angular blocky, weak, dry, slightly hard, slightly plastic | C4 | SP-SC | 9.9 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-288+00-SW30 | 11/6/2006 | 5.7-6.6 | natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, common 10YR 4/6 dark yellowish brown mottle, dry, angular blocky, weak, dry, soft, Non-plastic, Horizon divided for sample analysis. | C5 | SP | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-288+00-SW30 | 11/6/2006 | 6.6-7.7 | natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, common 10YR 4/6 dark yellowish brown mottle, dry, angular blocky, weak, dry, soft, Non-plastic, Horizon divided for sample analysis. | C5 | SP | 8.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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"Estimated Total TEQ" is aggregate indicator congener TEQ multiplied by correlation factor of 1.1x.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-288+00-SW75 | 11/6/2006 | 0.0-0.4 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | 2A | SM | 23 | 39 | 3900 | 1800 | 1500 | 2200 | 9300 | 1200 | Alta |
| RN-288+00-SW75 | 11/6/2006 | 0.4-1.7 | high terrace | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 10.1 | <4 | 6700 | 2800 | 2200 | 2900 | 15000 | 1900 | Alta |
| RN-288+00-SW75 | 11/6/2006 | 1.7-3.8 | high terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, weak, moist, friable, slightly plastic, Thin layer 10YR 6/3 fine sand at 1.9' | C2 | ML/CL | 21.6 | <4 | 91 | 39 | 35 | 36 | 200 | 28 | Alta |
| RN-288+00-SW75 | 11/6/2006 | 3.8-4.2 | high terrace | 10YR 2/1 black loam, moist, subangular blocky, moderate, moist, friable, slightly plastic, Very dark buried A horizon. | 2Ab | ML/CL | 20.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-288+00-SW75 | 11/6/2006 | 4.2-5.5 | high terrace | 10YR 5/3 brown fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, very friable, slightly plastic, Horizon divided for sample analysis. | 2C3 | SM | 10.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-288+00-SW75 | 11/6/2006 | 5.5-6.6 | high terrace | 10YR 5/3 brown fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, very friable, slightly plastic, Horizon divided for sample analysis. | 2C3 | SM | 10.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-IC-C | 10/10/2006 | 0.0-1.1 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few medium roots, fine and medium sand very few coarse sand very few shell fragments very few angular glossy black coarse sand subrounded grains well sorted wood/black material layer at 0.5 feet | 1 | SP | 5.5 | <4 | 20 | 5 | 6 | 8 | 38* | <10* | Dow |
| RN-290+50-IC-C | 10/10/2006 | 1.1-1.4 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, common medium roots, very few coarse sand very few shell fragments very few fine gravel very few angular glossy black coarse sand subrounded grains wood/black material at 1.3' | 2 | SM | 19.8 | <4 | 360 | 59 | 73 | 42 | 530 | 72 | Dow |
| RN-290+50-IC-C | 10/10/2006 | 1.4-1.9 | in-channel | 10YR 4/1 dark gray loamy sand, moist, single grain, moist, loose, Non-plastic, medium loamy sand common coarse sand and few shell fragments few fine gravel few angular glossy black coarse sand subrounded grains | 3 | SM | 14.9 | <4 | 47 | 13 | 16 | 16 | 92 | 15 | Dow |
| RN-290+50-IC-NE | 10/10/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few angular glossy black coarse sand subrounded grains very well sorted | 1 | SP | 2.3 | <4 | 8 | <4 | <4 | 7 | <20* | <10* | Dow |
| RN-290+50-IC-NE | 10/10/2006 | 0.6-1.6 | in-channel | 10YR 4/3 brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few shell fragments very few angular glossy black coarse sand subrounded grains | 2 | SM | 9.9 | <4 | 10 | 4 | 7 | 15 | 36* | <10* | Dow |
| RN-290+50-IC-NE | 10/10/2006 | 1.6-2.0 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, common coarse sand very few shell fragments common angular glossy black coarse sand and gravel subrounded grains | 3 | SM | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-IC-SW | 10/10/2006 | 0.0-0.7 | in-channel | 10YR 4/2 dark grayish brown sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, few fine gravel few angular glossy black coarse sand very few shell fragments subrounded grains | 1 | SM | 14 | <4 | 500 | 150 | 90 | 50 | 780 | 97 | Dow |
| RN-290+50-IC-SW | 10/10/2006 | 0.7-1.0 | in-channel | 10YR 3/1 very dark gray sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, very few fine gravel common shell fragments very few angular glossy black coarse sand subrounded grains | 2 | SM | 17.3 | <4 | <4 | <4 | <7 ^{LISR} | <4 | <23 | <10 | Dow |
| RN-290+50-NE100 | 8/17/2006 | 0.0-1.3 | historic natural levee | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 13.1 | 14 | 2500 | 1200 | 1200 | 1300 | 6200 | 870 | Dow |
| RN-290+50-NE100 | 8/17/2006 | 1.3-2.0 | historic natural levee | 10YR 4/3 brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, fewroots, Subangular blocky/granular. Snail shells (white) from 2.0-4.9' bgs, <2mm. | C1 | SM | 7.8 | 4 | 850 | 460 | 420 | 430 | 2200 | 300 | Dow |
| RN-290+50-NE100 | 8/17/2006 | 2.0-3.0 | historic natural levee | 10YR 4/3 brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, fewroots, Subangular blocky/granular. Snail shells (white) from 2.0-4.9' bgs, <2mm. | C1 | SM | 7.5 | <4 | 61 | 33 | 31 | 33 | 160 | 24 | Dow |
| RN-290+50-NE100 | 8/17/2006 | 3.0-4.0 | historic natural levee | 10YR 4/3 brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, fewroots, Subangular blocky/granular. Snail shells (white) from 2.0-4.9' bgs, <2mm. | C1 | SM | 7.9 | <4 | 27 | 17 | 13 | 16 | 72 | 10 | Alta |
| RN-290+50-NE100 | 8/17/2006 | 4.0-4.9 | historic natural levee | 10YR 4/3 brown sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, fewroots, Subangular blocky/granular. Snail shells (white) from 2.0-4.9' bgs, <2mm. | C1 | SM | 7.9 | <4 | 6 | <4 | <4 | <4 | <20 [*] | <10 [*] | Alta |
| RN-290+50-NE100 | 9/26/2006 | 4.9-6.2 | historic natural levee | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic | C2 | SM | 6.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE100 | 9/26/2006 | 6.2-7.3 | historic natural levee | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, friable, slightly plastic | C2 | SM | 5.8 | <4 | 99 | 40 | 30 | 30 | 200 | 27 | Alta |
| RN-290+50-NE1160 | 8/16/2006 | 0.0-1.5 | high terrace | 10YR 3/3 dark brown sand, dry, single grain, dry, loose, Non-plastic, common fine roots | A | SP | 9.1 | <4 | 7 | 4 | 4 | 7 | 21 [*] | <10 [*] | Alta |
| RN-290+50-NE1160 | 8/16/2006 | 0.0-1.5 Field Duplicate | high terrace | 10YR 3/3 dark brown sand, dry, single grain, dry, loose, Non-plastic, common fine roots | A | SP | 1.2 | <4 | 8 | 4 | 4 | 6 | 21 [*] | <10 [*] | Alta |
| RN-290+50-NE1160 | 10/16/2006 | 2.0-3.2 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic | C | SP | 9.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|--------------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-NE130 | 8/17/2006 | 0.0-1.4 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 13 | 5 | 350 | 180 | 230 | 200 | 960 | 150 | Dow |
| RN-290+50-NE130 | 8/17/2006 | 1.4-3.0 | high terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, White snail shells, whole specimens at 1.6', 3.0', and 4.1' bgs. | B | CL | 15.5 | <4 | 7 | 4 | <4 | 4 | <20 * | <10 * | Dow |
| RN-290+50-NE130 | 8/17/2006 | 3.0-4.0 | high terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, White snail shells, whole specimens at 1.6', 3.0', and 4.1' bgs. | B | CL | 23.7 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-290+50-NE130 | 8/17/2006 | 4.0-5.0 | high terrace | 10YR 4/3 brown clay loam, moist, subangular blocky, moist, friable, moderately plastic, few roots, White snail shells, whole specimens at 1.6', 3.0', and 4.1' bgs. | B | CL | 16.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE1320 | 8/16/2006 | 0.0-0.8 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, few fine roots, Field sample duplicate collected. | A2 | ML/CL | 12.6 | <4 | 200 | 100 | 85 | 120 | 500 | 69 | Alta |
| RN-290+50-NE1320 | 8/16/2006 | 0.0-0.8 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, few fine roots, Field sample duplicate collected. | A2 | ML/CL | 15.8 | 9 | 280 | 120 | 100 | 150 | 660 | 94 | Alta |
| RN-290+50-NE1320 | 8/16/2006 | 0.8-1.2 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, subangular blocky, moist, friable, moderately plastic | -- | ML/CL | 10.7 | <4 | 38 | 23 | 23 | 30 | 110 | 19* | Dow |
| RN-290+50-NE1320 | 8/16/2006 | 1.2-3.2 | low terrace | 10YR 5/4 yellowish brown sand, single grain, moist, loose, Non-plastic | 3C2 | SW | 10.7 | <4 | <6 | <9 ^{LIS} _R | <4 | <4 | <27 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-NE15 | 8/18/2006 | 0.0-1.0 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, slightly plastic, few fine roots | C1 | SP | 5 | 4 | 2000 | 970 | 750 | 800 | 4500 | 590 | Alta |
| RN-290+50-NE15 | 8/18/2006 | 1.0-2.0 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, slightly plastic, few fine roots | C1 | SP | 8.5 | 120 | 1200 | 550 | 510 | 970 | 3300 | 550 | Alta |
| RN-290+50-NE15 | 8/18/2006 | 2.0-2.9 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, slightly plastic, few fine roots | C1 | SP | 9 | 44 | 3900 | 1400 | 1600 | 3300 | 10000 | 1400 | Alta |
| RN-290+50-NE15 | 8/18/2006 | 2.9-4.0 | intermediate terrace | 10YR 3/3 dark brown loamy sand, dry, single grain, dry, loose, slightly plastic | C2 | SP | 11.6 | <6 | 7100 | 3400 | 2800 | 3900 | 17000 | 2200 | Alta |
| RN-290+50-NE15 | 8/18/2006 | 4.0-5.0 | intermediate terrace | 10YR 3/3 dark brown loamy sand, dry, single grain, dry, loose, slightly plastic | C2 | SP | 5.3 | 8 | 31000 | 14000 | 11000 | 11000 | 66000 | 8700 | Alta |
| RN-290+50-NE15 | 9/26/2006 | 5.0-6.0 | intermediate terrace | 10YR 3/3 dark brown sandy loam, common 10YR 5/8 yellowish brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic, Mottles, common, fine to medium. | C3 | SM | 7.4 | 13 | 35000 | 22000 | 20000 | 22000 | 100000 | 14000 | Alta |
| RN-290+50-NE15 | 9/26/2006 | 6.0-7.0 | intermediate terrace | 10YR 5/4 yellowish brown and 10YR 5/2 grayish brown sand, moist, single grain, moist, loose, Non-plastic, Layer of 10YR 5/2 sandy loam, silty sand (SM), less than 0.1' thick at 7.9' and 8.7' bgs. | C4 | SP | 2.1 | <4 | 8800 | 2600 | 2300 | 1700 | 15000 | 2000 | Alta |
| RN-290+50-NE15 | 9/26/2006 | 7.0-8.0 | intermediate terrace | 10YR 5/4 yellowish brown and 10YR 5/2 grayish brown sand, moist, single grain, moist, loose, Non-plastic, Layer of 10YR 5/2 sandy loam, silty sand (SM), less than 0.1' thick at 7.9' and 8.7' bgs. | C4 | SP | 5.7 | <4 | 880 | 300 | 240 | 260 | 1700 | 210 | Alta |
| RN-290+50-NE15 | 9/26/2006 | 8.0-9.4 | intermediate terrace | 10YR 5/4 yellowish brown and 10YR 5/2 grayish brown sand, moist, single grain, moist, loose, Non-plastic, Layer of 10YR 5/2 sandy loam, silty sand (SM), less than 0.1' thick at 7.9' and 8.7' bgs. | C4 | SP | 17.4 | <4 | 1000 | 270 | 270 | 240 | 1800 | 240 | Alta |
| RN-290+50-NE15 | 9/26/2006 | 9.4-10.0 | intermediate terrace | 10Y 4/1 dark greenish gray sand, common 10YR 5/8 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, Black wood fragment layers of ~0.5' thick at 8.5', 9.4', and 9.8' (burned?) Mottles ~8.0-9.4' bgs, common, medium. | C5 | SP | 20.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE210 | 8/17/2006 | 0.0-1.6 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, few roots | A | SM | 10.9 | 9 | 2000 | 1000 | 1000 | 1100 | 5000 | 710 | Dow |
| RN-290+50-NE210 | 8/17/2006 | 1.6-2.0 | low terrace | 10YR 3/4 dark yellowish brown loam, few 7.5YR 5/6 strong brown mottle, moist, subangular blocky, moist, friable, slightly plastic, few roots | B1 | SM | 12.3 | <4 | 740 | 380 | 350 | 320 | 1800 | 250 | Dow |
| RN-290+50-NE210 | 8/17/2006 | 2.0-3.2 | low terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic | C | SM | 9.3 | <4 | 14 | 6 | 6 | 7 | 33* | <10* | Alta |
| RN-290+50-NE210 | 8/17/2006 | 3.2-4.7 | low terrace | 10YR 4/3 brown clay loam, few mottle, moist, subangular blocky, moist, friable, moderately plastic, Horizon: B2t. Mottles, 2-10%, fine. | -- | CL | 20.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-NE40 | 8/17/2006 | 0.0-2.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | CL | 10.8 | 30 | 22000 | 13000 | 9300 | 9300 | 53000 | 7000 | Dow |
| RN-290+50-NE40 | 8/17/2006 | 2.3-3.0 | low terrace | 10YR 5/4 yellowish brown sand, dry, dry, loose, Non-plastic, Undecomposed black wood and fibers at 4.0-5.0' bgs. | C1 | SW | 4.3 | 11 | 7400 | 3000 | 3000 | 2800 | 16000 | 2200 | Dow |
| RN-290+50-NE40 | 8/17/2006 | 3.0-4.0 | low terrace | 10YR 5/4 yellowish brown sand, dry, dry, loose, Non-plastic, Undecomposed black wood and fibers at 4.0-5.0' bgs. | C1 | SW | 3.4 | <4 | 660 | 290 | 240 | 230 | 1400 | 190 | Alta |
| RN-290+50-NE40 | 8/17/2006 | 4.0-5.0 | low terrace | 10YR 5/4 yellowish brown sand, dry, dry, loose, Non-plastic, Undecomposed black wood and fibers at 4.0-5.0' bgs. | C1 | SW | 5.8 | <4 | 200 | 110 | 96 | 170 | 570 | 78 | Alta |
| RN-290+50-NE40 | 9/26/2006 | 5.0-6.4 | low terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, Dry to 6.0', then moist. Dark wood fragment layers (burned?) 5.5-6.4' bgs, sample collected | C1 | SP | 18.9 | <4 | 13 | 5 | 4 | 6 | 28* | <10* | Alta |
| RN-290+50-NE40 | 9/26/2006 | 6.4-7.0 | low terrace | N 4/0 dark gray clay loam, wet, massive, moist, firm, moderately plastic, Dark wood fragment layers less than 0.2' thick at 6.5', and 7.5-8.0' bgs. | 2C2 | CL | 22.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE40 | 9/26/2006 | 7.0-8.0 | low terrace | N 4/0 dark gray clay loam, wet, massive, moist, firm, moderately plastic, Dark wood fragment layers less than 0.2' thick at 6.5', and 7.5-8.0' bgs. | 2C2 | CL | 30.5 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-290+50-NE465 | 8/16/2006 | 0.0-1.4 | high terrace | 10YR 3/2 very dark grayish br loamy sand, single grain, dry, loose, slightly plastic, few fine roots, Single grain/granular | A | SP | 3.8 | <4 | 130 | 65 | 59 | 77 | 330 | 47 | Alta |
| RN-290+50-NE465 | 9/26/2006 | 1.4-3.8 | high terrace | 10YR 5/6 yellowish brown sand, dry, single grain, dry, loose, Non-plastic | 2C2 | SP | 6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE465 | 9/26/2006 | 3.8-4.7 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic | 2C3 | SP | 12.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE465 | 9/26/2006 | 4.7-4.9 | high terrace | 10YR 5/2 grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, moist, firm, moderately plastic, Mottles, common, medium. | 2C4 | ML/CL | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE510 | 8/16/2006 | 0.0-1.2 | upland | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, slightly plastic, common fine roots, Single grain & granular. Field sample duplicate collected. | A | SP | 5.3 | 7 | 160 | 78 | 69 | 82 | 400 | 60 | Alta |
| RN-290+50-NE510 | 8/16/2006 | 0.0-1.2 Field Duplicate | upland | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, slightly plastic, common fine roots, Single grain & granular. Field sample duplicate collected. | A | SP | 5 | 6 | 160 | 76 | 66 | 77 | 380 | 57 | Alta |
| RN-290+50-NE510 | 9/26/2006 | 1.6-2.2 | upland | 5YR 5/4 reddish brown sand, moist, single grain, moist, loose, Non-plastic, concretions, Horizon: Bsc. Iron concretions. | -- | SP | 9.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE510 | 9/26/2006 | 2.2-2.7 | upland | 5YR 5/8 yellowish red sand, moist, single grain, moist, loose, Non-plastic, concretions, | C | SP | 5.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-NE510 | 9/26/2006 | 2.7-3.8 | upland | 5YR 5/8 yellowish red sand, moist, single grain, moist, loose, Non-plastic, concretions, | C | SP | 7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-SW280 | 9/24/2006 | 0.0-1.2 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field sample duplicate collected. | A | SM | 25 | 14 | 1700 | 770 | 630 | 910 | 4000 | 530 | Alta |
| RN-290+50-SW280 | 9/24/2006 | 0.0-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field sample duplicate collected. | A | SM | 24.8 | 16 | 1800 | 940 | 730 | 1000 | 4500 | 600 | Alta |
| RN-290+50-SW280 | 9/24/2006 | 1.2-2.4 | low terrace | 10YR 3/3 dark brown clay loam, moist, granular, moist, friable, moderately plastic, few fine roots, Granular/subangular blocky. | AB | CL | 18.1 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-290+50-SW280 | 9/24/2006 | 2.4-4.0 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, Mottles, common, medium. | Bt | CL | 16.4 | <4 | 17 | 12 | 9 | 14 | 51 | <10 * | Alta |
| RN-290+50-SW280 | 9/24/2006 | 4.0-5.7 | low terrace | 10YR 5/4 yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, wet, single grain, moist, friable, slightly plastic, few fine roots, Silty sand to loamy sand. Single grain/granular. White fresh water shells, <2mm diameter, <2% volume. Mottles, common, medium. Field sample duplicate collected. | C | SW-SM | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-290+50-SW280 | 9/24/2006 | 4.0-5.7 Field Duplicate | low terrace | 10YR 5/4 yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, wet, single grain, moist, friable, slightly plastic, few fine roots, Silty sand to loamy sand. Single grain/granular. White fresh water shells, <2mm diameter, <2% volume. Mottles, common, medium. Field sample duplicate collected. | C | SW-SM | 13.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-SW30 | 9/23/2006 | 0.0-0.5 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots. Granular/single grain. Field sample duplicate collected. | 3A2 | SW | 15.8 | 14 | 8500 | 3700 | 3300 | 3600 | 19000 | 2600 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 0.0-0.5 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots. Granular/single grain. Field sample duplicate collected. | 3A2 | SW | 15.2 | 15 | 7700 | 3500 | 3400 | 3300 | 18000 | 2500 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 0.0-0.5 Lab Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots. Granular/single grain. Field sample duplicate collected. | 3A2 | SW | 15.3 | 22 | 8600 | 4300 | 3900 | 3900 | 21000 | 2800 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 0.5-1.6 | intermediate terrace | 10YR 3/3 dark brown loamy sand, moist, single grain, moist, very friable, slightly plastic, few roots | Ac | SW | 8.5 | 12 | 9700 | 3300 | 3600 | 2800 | 19000 | 2700 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 1.6-2.3 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, Loamy sand to sandy loam. Granular/single grain. Slightly plastic to moderately plastic. Slightly hard to moderately hard. Plant fragments. | 3C1 | SM | 4.1 | <4 | 950 | 370 | 360 | 250 | 1900 | 270 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 2.3-3.4 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, Loamy sand to sandy loam. Granular/single grain. Slightly plastic to moderately plastic. Slightly hard to moderately hard. Plant fragments. | 3C1 | SM | 6.8 | <4 | 270 | 120 | 110 | 110 | 600 | 84 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 3.4-4.0 | intermediate terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, Loamy sand to sandy loam. Granular/single grain. Slightly plastic to moderately plastic. Slightly hard to moderately hard. Plant fragments. | 3C1 | SM | 15.1 | <4 | 32 | 15 | 15 | 13 | 75 | 13 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 3.4-4.0 Lab Duplicate | intermediate terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, Loamy sand to sandy loam. Granular/single grain. Slightly plastic to moderately plastic. Slightly hard to moderately hard. Plant fragments. | 3C1 | SM | 16.1 | <4 | 24 | 10 | 9 | 10 | 54 | <10 * | Dow |
| RN-290+50-SW30 | 9/23/2006 | 4.0-5.0 | intermediate terrace | 10YR 3/2 very dark grayish br clay loam, dry, granular, dry, hard, moderately plastic, Granular/subangular blocky. Plant fragments | 2Ab | ML/CL | 15 | <4 | 46 | 17 | 20 | 15 | 100 | 16 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 5.0-6.5 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, slightly plastic, Loamy sand grading to sandy loam. Subangular blocky/granular. Slightly to moderately plastic. Mottles from below 6.5', common, medium. 6.5-7.5' - Field sample duplicate collected. | 3C2 | SM | 8.6 | <4 | 180 | 77 | 85 | 72 | 420 | 60 | Dow |
| RN-290+50-SW30 | 9/23/2006 | 6.5-7.5 Field Duplicate | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, slightly plastic, Loamy sand grading to sandy loam. Subangular blocky/granular. Slightly to moderately plastic. Mottles from below 6.5', common, medium. 6.5-7.5' - Field sample duplicate collected. | 3C2 | SM | 12.1 | <4 | 510 | 210 | 220 | 190 | 1100 | 160 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-SW30 | 9/23/2006 | 6.5-7.5 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, slightly plastic, Loamy sand grading to sandy loam. Subangular blocky/granular. Slightly to moderately plastic. Mottles from below 6.5', common, medium. 6.5-7.5' - Field sample duplicate collected. | 3C2 | SM | 11.7 | <4 | 410 | 170 | 180 | 170 | 940 | 130 | Dow |
| RN-290+50-SW30 | 11/29/2006 | 7.5-8.3 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, slightly plastic, Loamy sand grading to sandy loam. Subangular blocky/granular. Slightly to moderately plastic. | 3C2 | SM | 13.9 | <4 | 61 | 24 | 25 | 23 | 130 | 21 | Dow |
| RN-290+50-SW30 | 11/29/2006 | 8.3-9.2 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy loam, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, slightly plastic, Loamy sand grading to sandy loam. Subangular blocky/granular. Slightly to moderately plastic. Lower 0.2' is sand (10YR 5/4), single grain, dry, nonplastic, loose. | 3C3 | SM | 16.9 | <4 | 11 | 5 | 4 | 5 | 25* | <10* | Dow |
| RN-290+50-SW30 | 11/29/2006 | 9.2-9.8 | intermediate terrace | 10YR 5/3 brown sandy clay loam, few 7.5YR 5/8 strong brown mottle, wet, subangular blocky, moist, friable, moderately plastic | 3C4 | ML/CL | 19.1 | <4 | 11 | 5 | 5 | 4 | 24* | <10* | Dow |
| RN-290+50-SW30 | 11/29/2006 | 9.8-10.8 | intermediate terrace | 10YR 5/3 brown loam, few 7.5YR 5/8 strong brown mottle, wet, subangular blocky, moist, friable, moderately plastic, White freshwater shells. | 3C5 | ML | 19 | <5 | <13 ^{LISR} | <12 ^{LISR} | <13 ^{LISR} | <23 ^{LISR} | <66 | <10 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-SW40 | 9/23/2006 | 0.0-1.4 | natural levee | 10YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, common fine roots, Roots common to 0.5' then few. | C1 | SP | 8.5 | 6 | 2500 | 1100 | 1100 | 970 | 5700 | 790 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 0.0-1.4 Field Duplicate | natural levee | 10YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, common fine roots, Roots common to 0.5' then few. | C1 | SP | 16.6 | 24 | 2100 | 780 | 830 | 1000 | 4700 | 660 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 1.4-2.5 | natural levee | 10YR 3/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Few roots, fine to coarse to 3.6' bgs. | C2 | SP | 6 | <4 | 65 | 27 | 25 | 15 | 130 | 20 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 2.5-3.6 | natural levee | 10YR 3/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Few roots, fine to coarse to 3.6' bgs. | C2 | SP | 6.3 | <4 | 21 | 8 | 11 | 12 | 52 | <10 * | Dow |
| RN-290+50-SW40 | 9/23/2006 | 3.6-4.5 | natural levee | 10YR 3/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Few roots, fine to coarse to 3.6' bgs. | C2 | SP | 6.2 | <4 | 30 | 13 | 18 | 25 | 86 | 15 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 4.5-5.9 | natural levee | 10YR 3/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Few roots, fine to coarse to 3.6' bgs. | C2 | SP | 10 | <4 | 19 | 9 | 10 | 10 | 47* | <10 * | Dow |
| RN-290+50-SW40 | 9/23/2006 | 5.9-7.0 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 3/2 very dark grayish br loam, dry, subangular blocky, dry, moderately hard, moderately plastic, few roots, Loam/clay loam | 2C3 | SM | 14.9 | <4 | <4 | <4 | <4 | <9 ^{LISR} | <25 | <10 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 7.0-8.1 | natural levee | 10YR 3/2 very dark grayish br silt loam, dry, subangular blocky, dry, hard, moderately plastic, White fresh water shells, <2 mm diameter. | 2C4 | ML | 11 | <4 | <4 | <4 | <4 | <5 ^{LISR} | <21 | <10 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 8.1-9.5 | natural levee | 10YR 4/3 brown loamy sand, few 10YR 6/8 brownish yellow mottle, dry, subangular blocky, dry, moderately hard, slightly plastic, Faint mottles, few, fine. 0.2' thick sand layer, poorly graded sand at 8.7' bgs. | 3C6 | SM | 10.2 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RN-290+50-SW40 | 9/23/2006 | 9.5-11.4 | natural levee | 10YR 6/4 light yellowish brow fine sand, many 7.5YR 5/8 strong brown mottle, dry, single grain, dry, loose, Non-plastic, Fine sand to loamy sand. Mottles, many 9.5 to 9.9 feet then common, medium. | 3C7 | SP | 9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-290+50-SW40 | 9/23/2006 | 11.4-13.0 | natural levee | 10YR 5/2 grayish brown sandy clay loam, wet, granular, moist, friable, moderately plastic | 4C8 | ML/CL | 17.6 | <4 | 9 | <4 | 4 | 4 | <20 * | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+50-SW75 | 9/23/2006 | 0.0-0.4 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common roots | A | SM | 17.5 | 19 | 7000 | 3200 | 2900 | 2800 | 16000 | 2200 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 0.0-0.4 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common roots | A | SM | 20.1 | <4 | 1300 | 570 | 530 | 450 | 2900 | 390 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 0.4-1.1 | high terrace | 10YR 3/3 dark brown loam, moist, granular, moist, firm, few fine roots, Granular/subangular blocky. | C | SM | 13 | <4 | 40 | 18 | 17 | 13 | 88 | 14 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 1.1-2.2 | high terrace | 10YR 3/3 dark brown , moist, granular, moist, friable, moderately plastic, few fine roots | 2Ab | SM | 16.8 | 11 | 5800 | 2600 | 2500 | 2200 | 13000 | 1800 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 2.2-3.4 | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, Field sample duplicate collected. | 2C1 | SP | 3.4 | <4 | 46 | 22 | 22 | 21 | 110 | 17 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 2.2-3.4 Field Duplicate | high terrace | 10YR 4/6 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, Field sample duplicate collected. | 2C1 | SP | 3.6 | <4 | 40 | 22 | 21 | 18 | 100 | 16 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 3.4-4.4 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, firm, slightly plastic, Loamy sand to sandy loam. Mottles, few, fine. | 2C2 | SM | 9.6 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RN-290+50-SW75 | 9/23/2006 | 4.4-5.7 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, firm, slightly plastic, Loamy sand to sandy loam. Mottles, few, fine. | 2C2 | SM | 9.2 | <4 | 120 | 56 | 58 | 54 | 290 | 42 | Dow |
| RN-290+50-SW75 | 10/20/2006 | 5.7-6.8 | high terrace | 10YR 3/4 dark yellowish brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, firm, moderately plastic, few fine roots, trace of white freshwater snail shells, 10YR 4/3 sand (SP) from 6.6 to 6.8 | 2C3 | SM | 15.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-290+50-SW75 | 10/20/2006 | 6.8-7.9 | high terrace | 2.5Y 4/3 olive brown sandy clay loam, few 2.5Y 6/8 olive yellow mottle, moist, granular, moist, firm, moderately plastic, 10YR 5/4 yellowish brown sand layers (SP) thickness 0.2 ft throughout 6.8 to 9.0 | 2C4 | SM | 9.5 | <4 | 8 | 4 | <4 | <4 | <20 * | <10 * | Dow |
| RN-290+50-SW75 | 10/20/2006 | 7.9-9.0 | high terrace | 2.5Y 4/3 olive brown sandy clay loam, few 2.5Y 6/8 olive yellow mottle, moist, granular, moist, firm, moderately plastic, 10YR 5/4 yellowish brown sand layers (SP) thickness 0.2 ft throughout 6.8 to 9.0 | 2C4 | SM | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-290+55-NE15 | 10/24/2006 | 0.0-2.9 | intermediate terrace | | 8 | -- | 13 | 87 | 1700 | 670 | 620 | 1300 | 4300 | 640 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 2.9-5.0 | intermediate terrace | | 8 | -- | 3.3 | 5 | 2500 | 1100 | 940 | 1500 | 6100 | 800 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 5.0-6.0 | intermediate terrace | | 8 | -- | 3.7 | 26 | 84000 | 36000 | 30000 | 28000 | 180000 | 23000 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 6.0-9.4 | intermediate terrace | | 8 | -- | 9.8 | 9 | 43000 | 18000 | 15000 | 12000 | 87000 | 12000 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 9.4-10.0 | intermediate terrace | | 8 | -- | 18.1 | <4 | 55 | 19 | 15 | 15 | 100 | 15 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 10.0-10.5 | intermediate terrace | | -- | -- | 23.6 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-290+55-NE15 | 10/24/2006 | 10.5-12.0 | intermediate terrace | | -- | -- | 20.2 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-290+55-NE15 | 10/24/2006 | 12.0-13.3 | intermediate terrace | | -- | -- | 17.2 | <4 | 1300 | 560 | 440 | 400 | 2700 | 350 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 13.3-16.0 | intermediate terrace | | -- | -- | 25.6 | <4 | 10 | 5 | 4 | <4 | <20 * | <10 * | Alta |
| RN-290+55-NE15 | 10/24/2006 | 16.0-17.0 | intermediate terrace | | -- | -- | 17.5 | <4 | 1200 | 630 | 460 | 430 | 2800 | 360 | Alta |
| RN-290+55-NE15 | 10/24/2006 | 17.0-20.0 | intermediate terrace | | -- | -- | 11.9 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-292+00-SW250 | 11/6/2006 | 0.0-1.0 | low terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 19.4 | 15 | 9600 | 4500 | 3600 | 3800 | 21000 | 2800 | Alta |
| RN-292+00-SW250 | 11/6/2006 | 1.0-2.5 | low terrace | 10YR 3/3 dark brown sandy clay loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | Bt | SM | 17.3 | <4 | 170 | 72 | 59 | 66 | 360 | 50 | Alta |
| RN-292+00-SW250 | 11/6/2006 | 2.5-4.0 | low terrace | 2.5Y 4/3 olive brown clay loam, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, trace white freshwater shells | C1 | ML | 19.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-292+00-SW250 | 11/6/2006 | 4.0-4.4 | low terrace | 2.5Y 5/3 light olive brown sandy clay loam, few 7.5YR 5/8 strong brown mottle, wet, subangular blocky, moist, friable, moderately plastic, few fine roots, trace white freshwater shells | C2 | SM | 18.2 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-293+00-NE10 | 11/2/2006 | 0.0-1.3 | natural levee | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moderate, moist, friable, slightly plastic, few fine roots | A | SM | 18.7 | 66 | 2300 | 1000 | 910 | 1600 | 5900 | 840 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 1.3-2.9 | natural levee | 10YR 4/3 brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Thin (0.2') layer of 10YR 6/3 fine sand at 2.0' | AC | SP | 10.9 | 180 | 14000 | 4200 | 3400 | 4900 | 26000 | 3500 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 2.9-4.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 8.5 | 20.3 | 70000 | 28000 | 25000 | 21000 | 140000 | 19000 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 4.0-5.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 9.3 | 31 | 33000 | 12000 | 9200 | 8900 | 63000 | 8000 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 5.0-6.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 16.8 | 40 | 53000 | 17000 | 18000 | 14000 | 100000 | 14000 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 6.0-7.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 12.5 | 10 | 15000 | 2700 | 3500 | 1700 | 23000 | 3100 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 7.0-8.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 12.4 | <4 | 72 | 31 | 28 | 24 | 160 | 23 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 8.0-9.0 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Stratified layers of fine sand (10YR 6/4) and fine sandy loam (10YR 4/2, ranges from a loamy fine sand to a sandy clay loam). Irregular very thin layers containing more organic matter (color is 10YR 3/2). Horizon divided for sample analysis. | C1 | SP | 9.4 | 26 | 48000 | 17000 | 15000 | 14000 | 94000 | 12000 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 9.0-10.0 | natural levee | 10YR 5/2 grayish brown very fine sand, moist, single grain, moist, loose, Non-plastic, Layer of decaying wood fragments (0.2' thick, 10YR 2/1) at 9.5' | C2 | SP | 24.8 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-293+00-NE10 | 11/2/2006 | 10.0-10.8 | natural levee | 10YR 2/1 black . Entire horizon is decaying wood. Small amounts of sand mixed in. | C3 | -- | 30.1 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-293+00-NE10 | 11/2/2006 | 10.8-11.6 | natural levee | 2.5Y 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic | C4 | SP | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 11.6-12.0 | natural levee | 10YR 2/1 black, Entire horizon is decaying wood. Small amounts of sand mixed in. | C5 | -- | 36.2 | <4 | 11 | 5 | 4 | 4 | 24* | <10* | Alta |
| RN-293+00-NE10 | 11/2/2006 | 12.0-12.5 | natural levee | 10YR 4/2 dark grayish brown loamy fine sand, wet, single grain, moist, loose, Non-plastic | C6 | SP-SM | 16.5 | 13 | 40000 | 16000 | 14000 | 11000 | 82000 | 11000 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 12.5-13.5 | natural levee | 10YR 3/2 very dark grayish br and 10YR 4/1 dark gray loamy fine sand, wet, single grain, moist, loose, Non-plastic, Black mottling from organic matter (not redoximorphic). | Cg1 | SP-SM | 23.4 | 4 | 1700 | 640 | 560 | 550 | 3400 | 450 | Alta |
| RN-293+00-NE10 | 11/2/2006 | 13.5-14.4 | natural levee | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic | Cg2 | SP | 16.2 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-293+00-NE10 | 11/2/2006 | 14.4-16.0 | natural levee | 10YR 4/1 dark gray fine sand, wet, single grain, moist, loose, Non-plastic, Almost all decaying wood fragments. Some sand and a thin layer of silty clay loam mixed in. | Cg3 | SP | 35.4 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-293+00-NE10 | 11/2/2006 | 16.0-16.8 | natural levee | 10YR 5/4 yellowish brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, Medium subrounded gravel. Some coarse sand. | C7 | SP | 15.1 | <4 | 19 | 7 | 7 | 6 | 39* | <10* | Alta |
| RN-297+00-IC-C | 10/10/2006 | 0.0-1.3 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and medium sand very few coarse sand very few fine gravel very few angular glossy black coarse sand very few shell fragments subrounded grains well sorted | 1 | SP | 3 | <4 | 20 | 7 | 7 | 9 | 43* | <10* | Dow |
| RN-297+00-IC-C | 10/10/2006 | 1.3-2.1 | in-channel | 10YR 4/2 dark grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic, Medium loamy sand few coarse sand few shell fragments very few angular glossy black coarse sand subrounded grains | 2 | SM | 12.8 | <4 | 14 | 5 | 6 | 7 | 32* | <10* | Dow |
| RN-297+00-IC-C | 10/10/2006 | 2.1-2.4 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, common fine and medium gravel few angular glossy black coarse sand subrounded and subangular grains | 3 | SM | 6.7 | <4 | 12 | <4 | 4 | 4 | <20* | <10* | Dow |
| RN-297+00-IC-NE | 10/10/2006 | 0.0-0.6 | in-channel | 10YR 3/3 dark brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, subrounded grains | 1 | SM | 17.2 | <4 | 28 | 14 | 12 | 11 | 65 | 11 | Dow |
| RN-297+00-IC-NE | 10/10/2006 | 0.6-1.0 | in-channel | sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots, fine sandy loam | 2 | SM | 24.7 | <4 | 75 | 33 | 30 | 37 | 170 | 25 | Dow |
| RN-297+00-IC-NE | 10/10/2006 | 1.0-1.1 | in-channel | 10YR 4/1 dark gray coarse sand, moist, single grain, moist, loose, Non-plastic, few fine gravel very fine angular glossy black coarse sand very few shell fragments subrounded grains somewhat poorly sorted | 3 | SW | 12.8 | <4 | 9 | <4 | <4 | 4 | <20* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-IC-SW | 10/10/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic, very few coarse roots, medium loamy sand very few coarse sand very few fine gravel few shell fragments few angular glossy black coarse sand subrounded grains | 1 | SM | 15.1 | <4 | 41 | 12 | 11 | 35 | 99 | 14 | Dow |
| RN-297+00-IC-SW | 10/10/2006 | 0.3-1.0 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, very few coarse roots, few fine and medium gravel common shell fragments few angular glossy black coarse sand subrounded and subangular grains | 2 | SM | 12.5 | <4 | 25 | 7 | 8 | 8 | 49* | <10 [*] | Dow |
| RN-297+00-NE1020 | 8/18/2006 | 0.0-0.8 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SM | 7.9 | <4 | 130 | 58 | 52 | 68 | 310 | 43 | Alta |
| RN-297+00-NE1020 | 8/18/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SM | 7.6 | 4 | 150 | 69 | 58 | 81 | 360 | 51 | Alta |
| RN-297+00-NE1020 | 8/18/2006 | 0.8-1.5 | high terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SW | 7 | <4 | 11 | 7 | 5 | 7 | 29* | <10 [*] | Alta |
| RN-297+00-NE1020 | 8/18/2006 | 1.5-2.3 | high terrace | 10YR 5/4 yellowish brown coarse sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C2 | SP | 26.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE1020 | 8/18/2006 | 2.3-3.0 | high terrace | 10YR 4/4 dark yellowish brown coarse sand, wet, single grain, dry, loose, Non-plastic, few fine roots | C3 | SP | 20.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE110 | 8/20/2006 | 0.0-0.3 | historic natural levee | 10YR 3/2 very dark grayish br loam, moist, granular, moist, very friable, moderately plastic, few fine roots | A | SM | 16.5 | 6 | 630 | 370 | 340 | 400 | 1700 | 240 | Dow |
| RN-297+00-NE110 | 8/20/2006 | 0.3-2.2 | historic natural levee | 10YR 3/3 dark brown loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots, fine mottles | B | SM | 16.8 | <4 | 27 | 13 | 13 | 8 | 61 | 10* | Dow |
| RN-297+00-NE110 | 8/20/2006 | 2.2-3.3 | historic natural levee | 10YR 3/3 dark brown loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots, fine mottles | B | SM | 14.6 | <4 | 23 | 12 | 12 | 12 | 59 | 10* | Dow |
| RN-297+00-NE110 | 8/20/2006 | 3.3-4.3 | historic natural levee | 10YR 3/3 dark brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots, fine mottles B2t | Bit | SM | 17 | <4 | 9 | 7 | 6 | 8 | 30* | <10 [*] | Dow |
| RN-297+00-NE110 | 8/20/2006 | 4.3-5.3 | historic natural levee | 10YR 3/3 dark brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots, fine mottles B2t | Bit | SM | 17.2 | <4 | 12 | 8 | 10 | 14 | 44* | <10 [*] | Dow |
| RN-297+00-NE110 | 8/20/2006 | 5.3-6.3 | historic natural levee | 10YR 3/3 dark brown clay loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots, fine mottles B2t | Bit | SM | 18.1 | <4 | 13 | 7 | 6 | 7 | 33* | <10 [*] | Dow |

NOTES:

All concentrations are expressed on a dry weight basis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-NE1270 | 8/18/2006 | 0.0-0.9 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, loam/clay loam Field Duplicate | A | SM | 7.3 | 6 | 180 | 100 | 80 | 130 | 500 | 71 | Alta |
| RN-297+00-NE1270 | 8/18/2006 | 0.0-0.9 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, loam/clay loam Field Duplicate | A | SM | 6.7 | 5 | 160 | 92 | 70 | 120 | 440 | 62 | Alta |
| RN-297+00-NE1270 | 8/18/2006 | 0.9-1.5 | low terrace | 10YR 3/3 dark brown loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, loam/clay loam | B | SM | 10.8 | <4 | 12 | 6 | 5 | 8 | 33* | <10* | Alta |
| RN-297+00-NE1270 | 8/18/2006 | 1.5-3.1 | low terrace | 10YR 5/3 brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C | SP | 9.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE1370 | 8/18/2006 | 0.0-1.2 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, loam/clay loam Field Duplicate | A | SM | 11.9 | 7 | 310 | 140 | 120 | 180 | 750 | 100 | Alta |
| RN-297+00-NE1370 | 8/18/2006 | 0.0-1.2 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, loam/clay loam Field Duplicate | A | SM | 12.1 | 6 | 180 | 95 | 77 | 120 | 470 | 67 | Alta |
| RN-297+00-NE1370 | 8/18/2006 | 1.2-2.4 | low terrace | 10YR 3/3 dark brown loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, loam/clay loam, fine mottles | B | SM | 12.1 | <4 | 9 | 6 | 4 | 7 | 26* | <10* | Alta |
| RN-297+00-NE1370 | 8/18/2006 | 2.4-3.2 | low terrace | 10YR 5/3 brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C | SP | 11.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE165 | 8/20/2006 | 0.0-1.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 18.2 | 7 | 1300 | 600 | 490 | 630 | 3000 | 400 | Alta |
| RN-297+00-NE165 | 8/20/2006 | 1.3-3.0 | low terrace | 10YR 3/2 very dark grayish br clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few medium roots, fine to medium mottles clay loam/loam | Bt | ML/CL | 14.8 | <4 | 14 | 6 | 6 | 9 | 36* | <10* | Alta |
| RN-297+00-NE165 | 8/20/2006 | 3.0-3.5 | low terrace | 10YR 5/4 yellowish brown loam, few 10YR 5/6 yellowish brown mottle, moist, massive, moist, firm, moderately plastic, few medium roots, loam/clay loam | Bm | ML/CL | 10.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE165 | 8/20/2006 | 3.5-4.3 | low terrace | 10YR 5/4 yellowish brown loamy sand, moist, single grain, moist, friable, slightly plastic, few roots, saturated at 5.4' | C | SW | 9.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE165 | 8/20/2006 | 4.3-5.3 | low terrace | 10YR 5/4 yellowish brown loamy sand, moist, single grain, moist, friable, slightly plastic, few roots, saturated at 5.4' | C | SW | 7.8 | <4 | 16 | 9 | 12 | 16 | 53 | <10* | Dow |
| RN-297+00-NE165 | 8/20/2006 | 5.3-6.3 | low terrace | 10YR 5/4 yellowish brown loamy sand, moist, single grain, moist, friable, slightly plastic, few roots, saturated at 5.4' | C | SW | 13.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-NE240 | 8/20/2006 | 0.0-0.9 | upland | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, soft, slightly plastic, common fine roots | A | SM | 2.8 | <4 | 31 | 18 | 17 | 14 | 80 | 13 | Dow |
| RN-297+00-NE240 | 8/20/2006 | 0.9-2.4 | upland | 10YR 4/4 dark yellowish brown sand, dry, single grain, dry, soft, Non-plastic, few fine roots | C1 | SP | 2.1 | <4 | <4 | <4 | <5 LISR | <9 LISR | <26 | <10 | Dow |
| RN-297+00-NE240 | 8/20/2006 | 2.4-3.2 | upland | 10YR 4/6 dark yellowish brown sand, many 10YR 5/8 yellowish brown mottle, dry, single grain, dry, soft, Non-plastic, few fine roots, iron accumulation, coarse mottles, entire matrix with iron color | C2 | SP | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-NE25 | 8/21/2006 | 0.0-0.8 Field Duplicate | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, single grain, moist, very friable, Non-plastic, common fine roots, single grain/granular | A | SW | 6 | 6 | 2100 | 620 | 700 | 590 | 4000 | 550 | Dow |
| RN-297+00-NE25 | 8/21/2006 | 0.0-0.8 | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, single grain, moist, very friable, Non-plastic, common fine roots, single grain/granular | A | SW | 7 | 8 | 2400 | 1200 | 1100 | 1200 | 5800 | 800 | Dow |
| RN-297+00-NE25 | 8/21/2006 | 0.8-2.3 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 5.7 | 46 | 1100 | 530 | 590 | 1100 | 3300 | 500 | Dow |
| RN-297+00-NE25 | 8/21/2006 | 2.3-3.1 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 6.2 | <4 | 2900 | 1800 | 1500 | 2600 | 8700 | 1200 | Dow |
| RN-297+00-NE25 | 8/21/2006 | 3.1-4.3 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 4.2 | <4 | 5500 | 2200 | 2700 | 2600 | 13000 | 1900 | Dow |
| RN-297+00-NE25 | 8/21/2006 | 4.3-5.3 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 5.9 | 12 | 63000 | 26000 | 22000 | 21000 | 130000 | 17000 | Alta |
| RN-297+00-NE25 | 8/21/2006 | 5.3-6.3 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 4 | 11 | 52000 | 20000 | 17000 | 15000 | 100000 | 14000 | Alta |
| RN-297+00-NE25 | 8/21/2006 | 6.3-7.3 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 6.5 | 13 | 59000 | 22000 | 19000 | 16000 | 120000 | 15000 | Alta |
| RN-297+00-NE25 | 8/21/2006 | 7.3-8.1 | natural levee | 10YR 3/3 dark brown sand, moist, single grain, moist, very friable, Non-plastic | C | SP | 7.6 | 8 | 49000 | 18000 | 16000 | 13000 | 96000 | 13000 | Alta |
| RN-297+00-NE25 | 10/16/2006 | 8.1-9.2 | natural levee | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, layer of decomposing wood at 8.7' with very thin layer of loamy very fine sand beneath | C1 | SP | 15.6 | <4 | 3900 | 1300 | 1100 | 930 | 7300 | 950 | Alta |
| RN-297+00-NE25 | 10/16/2006 | 9.2-11.5 | natural levee | 10YR 4/2 dark grayish brown and 10YR 5/4 yellowish brown loam, common 10YR 5/6 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, structureless, moist, friable, slightly plastic, very few medium roots, alternating fine sand (10 YR 5/4) and loam (10 YR 4/2) decomposing wood at 10.5' mottles in fine sand are 10YR 5/6 and loam are 7.5YR 4/6 | C2 | ML/CL | 22 | <4 | 3400 | 1400 | 1200 | 1100 | 7100 | 930 | Alta |
| RN-297+00-NE25 | 10/16/2006 | 11.5-13.3 | natural levee | 10YR 4/1 dark gray and 10YR 2/1 black sand, moist, structureless, moist, loose, Non-plastic, >50% decaying wood fragments with sand in between thin layer of loamy material from 12.1-12.2 horizon divided for sample analysis | Cg | SW | 28.6 | <4 | 3900 | 740 | 990 | 580 | 6300 | 850 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-NE70 | 8/21/2006 | 0.0-1.1 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 16.4 | 40 | 3200 | 2000 | 2100 | 3400 | 11000 | 1500 | Dow |
| RN-297+00-NE70 | 8/21/2006 | 0.0-1.1 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 21 | 94 | 1800 | 1300 | 1100 | 2000 | 6200 | 910 | Dow |
| RN-297+00-NE70 | 8/21/2006 | 1.1-1.8 | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, few fine roots, granular/subangular blocky | B | SM | 14.9 | 43 | 31000 | 16000 | 16000 | 15000 | 79000 | 11000 | Dow |
| RN-297+00-NE70 | 8/21/2006 | 1.8-3.3 | low terrace | 10YR 5/4 yellowish brown sand, few 10YR 5/4 yellowish brown mottle, moist, single grain, moist, loose, fine mottles 1.0 cm thick silt lenses at 3.0', undecomposed wood debris throughout C | C1 | SP | 8.1 | <4 | 180 | 88 | 81 | 70 | 410 | 59 | Dow |
| RN-297+00-NE70 | 8/21/2006 | 3.3-4.0 | low terrace | 10YR 5/4 yellowish brown sand, few 10YR 5/4 yellowish brown mottle, moist, single grain, moist, loose, fine mottles 1.0 cm thick silt lenses at 3.0', undecomposed wood debris throughout C | C1 | SP | 11.1 | <4 | 98 | 55 | 52 | 52 | 260 | 37 | Dow |
| RN-297+00-NE70 | 8/21/2006 | 4.0-4.8 | low terrace | 10YR 6/2 light brownish gray sand, moist, single grain, moist, loose, few roots, charcoal wood (10%) | C2 | SP | 27.5 | <4 | 87 | 39 | 35 | 41 | 200 | 28 | Alta |
| RN-297+00-NE70 | 8/21/2006 | 4.8-5.8 | low terrace | 10Y 4/1 dark greenish gray sand, wet, moist, very friable, few roots, charcoal wood (40-70%) | 2Cg | SW | 27.6 | <4 | 78 | 35 | 28 | 47 | 190 | 26 | Alta |
| RN-297+00-NE70 | 8/21/2006 | 5.8-7.2 | low terrace | 10YR 3/2 very dark grayish br loam, wet, granular, moist, very friable, moderately plastic, few roots, charcoal wood (10-30%) Buried A horizon? | 3AB | SM | 30.9 | <4 | 33 | 12 | 11 | 17 | 72 | 11 | Alta |
| RN-297+00-NE70 | 10/16/2006 | 7.2-8.2 | low terrace | 10Y 4/1 dark greenish gray silt loam, wet, massive, moist, friable, moderately plastic, sulphur odor, Decomposed wood fragments 8.0-8.3' | 3Cg1 | ML | 32.3 | <4 | 15 | 7 | 6 | 11 | 39* | <10* | Alta |
| RN-297+00-NE70 | 10/16/2006 | 8.2-9.3 | low terrace | 10Y 4/1 dark greenish gray loamy sand, wet, single grain, moist, friable, slightly plastic, sulphur odor, Horizon: 3Cg2. | 3Cg2 | SM | 30.7 | <4 | 20 | 13 | 9 | 26 | 67 | 11 | Alta |
| RN-297+00-NE890 | 8/18/2006 | 0.0-1.1 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots | A | SM | 11 | 6 | 64 | 31 | 27 | 36 | 160 | 27 | Alta |
| RN-297+00-NE890 | 8/18/2006 | 1.1-1.7 | high terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 6.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE890 | 8/18/2006 | 1.7-2.9 | high terrace | 10YR 4/4 dark yellowish brown coarse sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 8.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-NE890 | 8/18/2006 | 2.9-3.1 | high terrace | 7.5YR 5/3 brown clay loam, few mottle, moist, massive, moist, firm, very plastic, few fine roots, clay loam/clay, gray mottles - 10GY 6/1 | 2C1 | CL | 24.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW100 | 9/24/2006 | 0.0-0.3 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 21.8 | 34 | 3900 | 1600 | 1400 | 1800 | 8700 | 1200 | Alta |
| RN-297+00-SW100 | 9/24/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 20.8 | 38 | 7200 | 3300 | 2600 | 3000 | 16000 | 2100 | Alta |
| RN-297+00-SW100 | 9/24/2006 | 0.3-1.1 | low terrace | 10YR 4/4 dark yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots, sand to loamy sand, loose to slightly hard | C1 | SW | 8.4 | <8 | 3500 | 1200 | 1300 | 1800 | 7900 | 1100 | Alta |
| RN-297+00-SW100 | 9/24/2006 | 1.1-2.8 | low terrace | 10YR 4/4 dark yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots, sand to loamy sand, loose to slightly hard | C1 | SW | 6.2 | <4 | 4700 | 2200 | 1800 | 2000 | 11000 | 1400 | Alta |
| RN-297+00-SW100 | 9/24/2006 | 2.8-3.4 | low terrace | 10YR 4/4 dark yellowish brown loam, few 10YR 6/8 brownish yellow mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, loam/clay loam, plant fragments, white freshwater shells, <2.0 mm diameter, < 2% volume, few to common medium mottles, < 2 mm below 3.0' | C2 | ML/CL | 8.4 | <4 | 13 | 6 | 5 | 6 | 30* | <10* | Alta |
| RN-297+00-SW100 | 9/24/2006 | 3.4-4.4 | low terrace | 10YR 4/4 dark yellowish brown loam, few 10YR 6/8 brownish yellow mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, loam/clay loam, plant fragments, white freshwater shells, <2.0 mm diameter, < 2% volume, few to common medium mottles, < 2 mm below 3.0' | C2 | ML/CL | 0 | <4 | 33 | 14 | 12 | 12 | 71 | 11 | Alta |
| RN-297+00-SW100 | 9/24/2006 | 4.4-5.5 | low terrace | 10YR 4/4 dark yellowish brown loam, few 10YR 6/8 brownish yellow mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, loam/clay loam, plant fragments, white freshwater shells, <2.0 mm diameter, < 2% volume, few to common medium mottles, < 2 mm below 3.0' | C2 | ML/CL | 12.3 | <4 | 31 | 15 | 13 | 14 | 73 | 12 | Alta |
| RN-297+00-SW100 | 10/20/2006 | 5.5-6.4 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, trace white freshwater snails | C3 | ML/CL | 19.4 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Dow |
| RN-297+00-SW100 | 10/20/2006 | 6.4-7.7 | low terrace | 10YR 4/2 dark grayish brown silty clay loam, common 7.5YR 5/8 strong brown mottle, wet, massive, moist, firm, moderately plastic, trace white freshwater snails, 10YR 5/4 yellowish brown sand (SP) from 6.4 to 6.8 ft, water at 6.4 ft | C4 | ML/CL | 21.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW150 | 11/6/2006 | 0.0-0.3 | high terrace | 10YR 2/2 very dark brown sandy loam, moist, granular, moist, friable, Non-plastic, few fine roots | A | SM | 19.1 | 21 | 14000 | 4500 | 4300 | 3900 | 26000 | 3500 | Alta |
| RN-297+00-SW150 | 11/6/2006 | 0.3-1.1 | high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, Non-plastic, few fine roots | C1 | SM | 15.1 | 12 | 37000 | 16000 | 14000 | 12000 | 79000 | 10000 | Alta |
| RN-297+00-SW150 | 11/6/2006 | 1.1-2.2 | high terrace | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, Non-plastic, few fine roots | C1 | SM | 14.5 | <4 | 220 | 87 | 79 | 72 | 450 | 63 | Alta |
| RN-297+00-SW150 | 11/6/2006 | 2.2-3.3 | high terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 8.7 | <4 | 31 | 12 | 10 | 10 | 62 | 10 | Alta |
| RN-297+00-SW150 | 11/6/2006 | 3.3-4.0 | high terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 6.3 | <4 | 440 | 170 | 140 | 130 | 870 | 110 | Alta |
| RN-297+00-SW150 | 11/6/2006 | 4.0-4.4 | high terrace | 10YR 3/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic | C3 | SM | 12 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW20 | 9/24/2006 | 0.0-2.2 | natural levee | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, Field Duplicate | C1 | SP | 11.2 | 9 | 590 | 210 | 210 | 300 | 1300 | 180 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 0.0-2.2 Field Duplicate | natural levee | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, Field Duplicate | C1 | SP | 10 | 8 | 310 | 160 | 160 | 270 | 900 | 130 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 2.2-3.5 | natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 3.5-4.6 | natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 3.1 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RN-297+00-SW20 | 9/24/2006 | 4.6-5.5 | natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 3.6 | <4 | 13 | 5 | 5 | 8 | 31 * | <10 * | Alta |
| RN-297+00-SW20 | 9/24/2006 | 5.5-6.2 | natural levee | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C2 | SP | 4.9 | <4 | 7 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RN-297+00-SW20 | 9/24/2006 | 6.2-7.3 | natural levee | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, fine mottles below 9.0' < 0.2' thick layer of 10YR 5/4 yellowish brown sand, SP at 6.5' and 7.9', single grain, nonplastic, loose, dry | 2C3 | SM | 6.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 7.3-8.4 | natural levee | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, fine mottles below 9.0' < 0.2' thick layer of 10YR 5/4 yellowish brown sand, SP at 6.5' and 7.9', single grain, nonplastic, loose, dry | 2C3 | SM | 8.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 8.4-9.5 | natural levee | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, fine mottles below 9.0' < 0.2' thick layer of 10YR 5/4 yellowish brown sand, SP at 6.5' and 7.9', single grain, nonplastic, loose, dry | 2C3 | SM | 12.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 9.5-10.6 | natural levee | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, fine mottles below 9.0' < 0.2' thick layer of 10YR 5/4 yellowish brown sand, SP at 6.5' and 7.9', single grain, nonplastic, loose, dry | 2C3 | SM | 12.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 10.6-11.2 | natural levee | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, fine mottles below 9.0' < 0.2' thick layer of 10YR 5/4 yellowish brown sand, SP at 6.5' and 7.9', single grain, nonplastic, loose, dry | 2C3 | SM | 16.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW20 | 9/24/2006 | 11.2-12.8 | natural levee | 10YR 4/6 dark yellowish brown clay loam, few 5YR 4/6 yellowish red and 7.5YR 6/8 reddish yellow mottle, moist, granular, moist, firm, moderately plastic, saturated at 12.2, friable to firm, medium mottles | 3C4 | CL | 19.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW200 | 9/24/2006 | 0.0-0.3 Field Duplicate | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field Duplicate | A | SM | 22.8 | 26 | 14000 | 6000 | 4900 | 5700 | 30000 | 4000 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 0.0-0.3 | low terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, common fine roots, Field Duplicate | A | SM | 23.8 | 30 | 18000 | 8400 | 6600 | 8300 | 41000 | 5400 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 0.3-2.2 | low terrace | 10YR 3/4 dark yellowish brown loam, few 10R 5/8 red mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, loam/clay loam, few to common medium mottles at 3.0' | Bt | SM | 10.8 | <4 | 610 | 170 | 170 | 130 | 1100 | 150 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 2.2-3.3 | low terrace | 10YR 3/4 dark yellowish brown loam, few 10R 5/8 red mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, loam/clay loam, few to common medium mottles at 3.0' | Bt | SM | 6.3 | <4 | 81 | 34 | 29 | 35 | 180 | 25 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 3.3-4.4 | low terrace | 10YR 6/4 light yellowish brow sand, moist, single grain, moist, loose, Non-plastic | 2C1 | SP | 7 | <4 | 7 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 4.4-4.8 | low terrace | 10YR 6/4 light yellowish brow sand, moist, single grain, moist, loose, Non-plastic | 2C1 | SP | 7.1 | <4 | 200 | 83 | 75 | 71 | 430 | 60 | Alta |
| RN-297+00-SW200 | 9/24/2006 | 4.8-5.6 | low terrace | 2.5Y 4/2 dark grayish brown clay loam, few 10YR 6/8 brownish yellow mottle, wet, massive, moist, friable, medium mottles | 3C2 | CL | 16.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW370 | 10/9/2006 | 0.0-0.3 Field Duplicate | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, 40% recovery | A2 | SM | 38.7 | 19 | 2900 | 1300 | 1300 | 1400 | 6800 | 960 | Dow |
| RN-297+00-SW370 | 10/9/2006 | 0.0-0.3 Lab Duplicate | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, 40% recovery | A2 | SM | 36.1 | 22 | 3900 | 1800 | 1700 | 1700 | 9100 | 1300 | Dow |
| RN-297+00-SW370 | 10/9/2006 | 0.0-0.3 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, 40% recovery | A2 | SM | 35.4 | 18 | 3800 | 1600 | 1700 | 1700 | 8600 | 1200 | Dow |
| RN-297+00-SW370 | 10/9/2006 | 0.3-2.2 | wetland | 10YR 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, trace white freshwater shells, moist to 1.6 then wet 30% recovery 1.1-2.2' 30% recovery 2.2-3.3' sample: 0.3-2.2', 2.2-3.9' | C1 | CL | 25.5 | 5 | 2400 | 1100 | 1100 | 1100 | 5600 | 770 | Dow |
| RN-297+00-SW370 | 10/9/2006 | 2.2-3.9 | wetland | 10YR 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, trace white freshwater shells, moist to 1.6 then wet 30% recovery 1.1-2.2' 30% recovery 2.2-3.3' sample: 0.3-2.2', 2.2-3.9' | C1 | CL | 28.2 | <4 | 13 | 7 | 6 | 6 | 31* | <10* | Dow |
| RN-297+00-SW370 | 10/9/2006 | 3.9-4.4 | wetland | 10YR 5/2 grayish brown clay, many 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic, plant fragment- partially decomposed samples: 3.9-4.4', 4.4-6.6' | C2 | CL | 24 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-297+00-SW370 | 10/9/2006 | 4.4-6.6 | wetland | 10YR 5/2 grayish brown clay, many 10YR 5/6 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic, plant fragment- partially decomposed samples: 3.9-4.4', 4.4-6.6' | C2 | CL | 22.2 | <4 | 16 | 8 | 7 | 7 | 39* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+00-SW40 | 9/24/2006 | 0.0-1.1 | high terrace | 10YR 3/2 very dark grayish br sand, moist, single grain, moist, loose, Non-plastic, few fine roots | A | SW | 12.4 | 10 | 680 | 280 | 290 | 470 | 1700 | 240 | Alta |
| RN-297+00-SW40 | 9/24/2006 | 1.1-2.4 | high terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 2C1 | SP | 6 | <4 | 19 | 7 | 8 | 12 | 46* | <10 * | Alta |
| RN-297+00-SW40 | 9/24/2006 | 2.4-3.6 | high terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 2C1 | SP | 4.4 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-297+00-SW40 | 9/24/2006 | 3.6-4.8 | high terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 2C1 | SP | 4.7 | <4 | 9 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RN-297+00-SW40 | 9/24/2006 | 4.8-6.2 | high terrace | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, few fine roots | 2C1 | SP | 6 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RN-297+00-SW40 | 9/24/2006 | 6.2-7.0 | high terrace | 10YR 5/4 yellowish brown sandy loam, moist, single grain, moist, friable, slightly plastic, single grain/granular white freshwater shells, <2mm diameter, <2% volume | 2C2 | SM | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW40 | 9/24/2006 | 7.0-8.0 | high terrace | 10YR 5/4 yellowish brown sandy loam, moist, single grain, moist, friable, slightly plastic, single grain/granular white freshwater shells, <2mm diameter, <2% volume | 2C2 | SM | 8.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW40 | 9/24/2006 | 8.0-9.2 | high terrace | 10YR 5/4 yellowish brown sandy loam, moist, single grain, moist, friable, slightly plastic, single grain/granular white freshwater shells, <2mm diameter, <2% volume | 2C2 | SM | 9.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-297+00-SW590 | 10/9/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, 30% recovery | A | SM | 41.8 | 21 | 810 | 470 | 420 | 520 | 2200 | 320 | Dow |
| RN-297+00-SW590 | 10/9/2006 | 0.0-0.3 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, 30% recovery | A | SM | 40.7 | 24 | 1100 | 470 | 450 | 490 | 2500 | 370 | Dow |
| RN-297+00-SW590 | 10/9/2006 | 0.3-3.3 | low terrace | 10YR 4/2 dark grayish brown clay, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, saturated @ 2.0', trace white freshwater shells limited sample recovery at 3.3' | C | CL | 28.3 | <4 | 100 | 55 | 51 | 49 | 260 | 38 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-----------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-297+05-NE25 | 11/7/2006 | 8.1-9.2 | natural levee | 10YR 5/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, layer of decomposing wood at 8.7' with very thin layer of loamy very fine sand beneath | C1 | SP | 5.2 | 20 | 16000 | 4100 | 5300 | 3300 | 28000 | 4000 | Dow |
| RN-297+05-NE25 | 11/7/2006 | 9.2-11.5 Field Duplicate | natural levee | 10YR 4/2 dark grayish brown and 10YR 5/4 yellowish brown loam, common 10YR 5/6 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, structureless, moist, friable, slightly plastic, very few medium roots, alternating fine sand (10 YR 5/4) and loam (10 YR 4/2) decomposing wood at 10.5' mottles in fine sand are 10YR 5/6 and loam are 7.5YR 4/6 | C2 | ML/CL | 17.5 | <4 | 2200 | 630 | 690 | 400 | 4000 | 540 | Dow |
| RN-297+05-NE25 | 11/7/2006 | 9.2-11.5 | natural levee | 10YR 4/2 dark grayish brown and 10YR 5/4 yellowish brown loam, common 10YR 5/6 yellowish brown and 7.5YR 4/6 strong brown mottle, moist, structureless, moist, friable, slightly plastic, very few medium roots, alternating fine sand (10 YR 5/4) and loam (10 YR 4/2) decomposing wood at 10.5' mottles in fine sand are 10YR 5/6 and loam are 7.5YR 4/6 | C2 | ML/CL | 18.8 | 5 | 3000 | 780 | 880 | 540 | 5200 | 710 | Dow |
| RN-297+05-NE25 | 11/7/2006 | 11.5-13.3 Lab Duplicate | natural levee | 10YR 4/1 dark gray and 10YR 2/1 black sand, moist, structureless, moist, loose, Non-plastic, >50% decaying wood fragments with sand in between thin layer of loamy material from 12.1-12.2 horizon divided for sample analysis | Cg | SW | 30.8 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |
| RN-297+05-NE25 | 11/7/2006 | 11.5-13.3 | natural levee | 10YR 4/1 dark gray and 10YR 2/1 black sand, moist, structureless, moist, loose, Non-plastic, >50% decaying wood fragments with sand in between thin layer of loamy material from 12.1-12.2 horizon divided for sample analysis | Cg | SW | 35 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RN-297+05-NE25 | 11/7/2006 | 13.3-15.0 | natural levee | 10YR 4/1 dark gray and 10YR 2/1 black sand, moist, structureless, moist, loose, Non-plastic, >50% decaying wood fragments with sand in between thin layer of loamy material from 12.1-12.2 horizon divided for sample analysis | Cg | SW | 34.8 | <4 | 6 | <4 | <6 ^{LISR} | <4 | <22 * | <10 * | Dow |
| RN-297+05-NE70 | 11/7/2006 | 9.3-10.0 | low terrace | 2.5Y 3/1 very dark gray sand, wet, structureless, moist, loose, Non-plastic, small decomposing wood fragments throughout, thin layer of fine sandy loam at 9.7' | 2Cg3 | SW | 17.3 | <4 | <4 | <4 | <4 | <8 | <24 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-302+00-SW25 | 11/6/2006 | 0.0-1.1 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, Non-plastic, common fine roots | C1 | SM | 15 | 18 | 2700 | 1200 | 990 | 1400 | 6300 | 840 | Alta |
| RN-302+00-SW25 | 11/6/2006 | 1.1-2.2 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, Non-plastic, common fine roots | C1 | SM | 9.1 | <5 | 11000 | 4500 | 3700 | 3700 | 22000 | 2900 | Alta |
| RN-302+00-SW25 | 11/6/2006 | 2.2-3.5 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, Non-plastic, few fine roots | C1 | SM | 13.2 | <4 | 1200 | 600 | 430 | 530 | 2800 | 350 | Alta |
| RN-302+00-SW25 | 11/6/2006 | 3.5-4.4 | natural levee | 10YR 4/6 dark yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 8.9 | <4 | 62 | 26 | 22 | 23 | 130 | 20 | Alta |
| RN-302+00-SW25 | 11/6/2006 | 4.4-5.1 | natural levee | 10YR 4/6 dark yellowish brown loamy sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 8 | <4 | 3500 | 1100 | 990 | 700 | 6300 | 830 | Alta |
| RN-302+00-SW25 | 11/6/2006 | 5.1-5.5 | natural levee | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | C3 | SP | 3 | <4 | 17 | 8 | 7 | 7 | 39* | <10* | Alta |
| RN-302+00-SW250 | 11/6/2006 | 0.0-0.6 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | ML/CL | 25.9 | 11 | 4200 | 2000 | 1600 | 1700 | 9500 | 1300 | Alta |
| RN-302+00-SW250 | 11/6/2006 | 0.6-1.1 | low terrace | 2.5Y 4/3 olive brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 20.1 | <4 | 1200 | 560 | 470 | 490 | 2800 | 370 | Alta |
| RN-302+00-SW250 | 11/6/2006 | 1.1-2.4 | low terrace | 2.5Y 4/3 olive brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 18.3 | <4 | 60 | 27 | 23 | 26 | 140 | 20 | Alta |
| RN-302+00-SW250 | 11/6/2006 | 2.4-3.3 | low terrace | 2.5Y 4/3 olive brown silty clay loam, few 10YR 5/8 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic | C2 | ML | 17.2 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-302+00-SW250 | 11/6/2006 | 3.3-3.8 | low terrace | 2.5Y 4/3 olive brown silty clay loam, few 10YR 5/8 yellowish brown mottle, wet, subangular blocky, moist, friable, moderately plastic | C2 | ML | 19.2 | <4 | 8 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-302+00-SW250 | 11/6/2006 | 3.8-4.4 | low terrace | 2.5Y 4/3 olive brown clay, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | C3 | CL | 19.2 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |
| RN-302+00-SW250 | 11/6/2006 | 4.4-5.5 | low terrace | 2.5Y 4/3 olive brown clay, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | C3 | CL | 21.9 | <4 | 5 | <4 | <4 | <4 | <20* | <10* | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-302+00-SW475 | 11/6/2006 | 0.0-0.6 | wetland | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, common fine roots, 50% recovery | A1 | ML | 34.5 | 17 | 3900 | 2000 | 1600 | 2000 | 9500 | 1300 | Alta |
| RN-302+00-SW475 | 11/6/2006 | 0.6-2.2 | wetland | 2.5Y 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic, few fine roots | C | CL | 23.2 | <4 | 120 | 51 | 44 | 55 | 270 | 37 | Alta |
| RN-302+00-SW475 | 11/6/2006 | 2.2-3.3 | wetland | 2.5Y 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, <15% gravel, wet, massive, moist, firm, moderately plastic, few fine roots | C | CL | 23.2 | <4 | 380 | 120 | 100 | 76 | 690 | 91 | Alta |
| RN-302+00-SW475 | 11/6/2006 | 3.3-4.4 | wetland | 2.5Y 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, <15% gravel, wet, massive, moist, firm, moderately plastic, few fine roots, 75% recovery, gravel at bottom of sample | C | CL | 20.3 | <4 | 340 | 120 | 100 | 72 | 630 | 84 | Alta |
| RN-305+00-IC-C | 10/10/2006 | 0.0-1.1 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few coarse roots, fine and medium sand few coarse sand few shell fragments subrounded grains somewhat well sorted very few angular glossy black coarse sand | 1 | SP | 4.2 | <4 | 78 | 33 | 31 | 35 | 180 | 25 | Dow |
| RN-305+00-IC-C | 10/10/2006 | 1.1-1.6 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few coarse roots, very few angular glossy black coarse sand subrounded grains well sorted root/black material at 1.6' | 2 | SP | 5.8 | 62 | 280 | 250 | 960 | 4800 | 6300 | 950 | Dow |
| RN-305+00-IC-C | 10/10/2006 | 1.6-2.6 | in-channel | 10YR 4/2 dark grayish brown coarse sand, moist, single grain, moist, loose, Non-plastic, medium and coarse sand very few fine gravel very few angular glossy black coarse sand common shell fragments subrounded grains somewhat well sorted | 3 | SP | 7.9 | <4 | 59 | 30 | 27 | 40 | 160 | 23 | Dow |
| RN-305+00-IC-C | 10/10/2006 | 2.6-3.2 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, common medium roots, few coarse sand very few fine gravel few shell fragments very few angular glossy black coarse sand subrounded grains root/black material at 2.8' | 4 | SM | 37.7 | 120 | 2700 | 1400 | 910 | 1600 | 6700 | 950 | Dow |
| RN-305+00-IC-NE | 10/10/2006 | 0.0-0.4 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, few coarse sand very few fine gravel very few shell fragments very few angular glossy black coarse sand subrounded | 1 | SM | 10.2 | <4 | 21 | 5 | 9 | 15 | 50* | <10* | Dow |
| RN-305+00-IC-NE | 10/10/2006 | 0.4-0.8 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few shell fragments few angular glossy black coarse sand subrounded grains | 2 | SM | 15.6 | <4 | 46 | 13 | 12 | 27 | 97 | 15 | Dow |
| RN-305+00-IC-NE | 10/10/2006 | 0.8-1.1 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine gravel few shell fragments few angular glossy black coarse sand subrounded grains | 3 | SM | 12.8 | 5 | 430 | 130 | 170 | 110 | 840 | 130 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+00-IC-SW | 10/11/2006 | 0.0-0.6 | in-channel | 10YR 5/2 grayish brown sand, moist, single grain, moist, loose, Non-plastic, few medium roots, Few, Fine gravel Few shell fragments Very few, angular glossy black course sand Wood/ black material at 0.6 | -- | SM | 22.2 | <4 | 180 | 83 | 70 | 74 | 410 | 56 | Alta |
| RN-305+00-IC-SW | 10/11/2006 | 0.6-0.9 | in-channel | 10YR 4/2 dark grayish brown loamy coarse sand, moist, single grain, moist, loose, Non-plastic, Common, fine gravel Few shell fragments Very few angular glossy black course sand Sub-rounded grains | -- | SM | 5.5 | <4 | 82 | 34 | 20 | 53 | 190 | 25 | Alta |
| RN-305+00-IC-SW | 10/11/2006 | 0.9-1.3 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, Few course sand Very few fine gravel Very few shell fragments Very few angular glossy black course sand Sub-rounded grains | -- | SM | 29.8 | <4 | 37 | 15 | 13 | 35 | 100 | 15 | Alta |
| RN-305+00-NE10 | 8/22/2006 | 0.0-1.6 | floodplain | 10YR 5/4 yellowish brown loamy sand, moist, single grain, moist, very friable, Non-plastic, common fine roots, Fine to medium roots. | C1 | SW | 24 | <6 | 400 | 160 | 170 | 150 | 880 | 120 | Dow |
| RN-305+00-NE10 | 8/22/2006 | 1.6-2.4 | floodplain | 10YR 5/6 yellowish brown , moist, single grain, moist, very friable, Non-plastic, fewroots | C2 | SW | 11.1 | 4 | 160 | 45 | 62 | 58 | 330 | 50 | Dow |
| RN-305+00-NE145 | 8/22/2006 | 0.0-1.1 | upland | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, Single grain. | A | SM | 6 | <4 | 110 | 73 | 72 | 75 | 330 | 49 | Dow |
| RN-305+00-NE145 | 8/22/2006 | 1.1-2.7 | upland | 10YR 4/6 dark yellowish brown , moist, single grain, moist, very friable, Non-plastic, fewroots | C1 | SP | 8.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-305+00-NE145 | 8/22/2006 | 2.7-3.6 | upland | 10YR 4/6 dark yellowish brown , moist, single grain, moist, very friable, Non-plastic, fewroots | C1 | SP | 14 | <4 | 4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-305+00-NE145 | 10/19/2006 | 3.6-4.4 | upland | 10YR 4/6 dark yellowish brown , moist, single grain, moist, very friable, Non-plastic, fewroots, saturated | C1 | SP | 17.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-305+00-NE145 | 10/19/2006 | 4.4-5.8 | upland | 10YR 4/2 dark grayish brown clay, few 10YR 5/6 yellowish brown mottle, wet, massive, moist, very firm, moderately plastic, saturated | C2 | CL | 22.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+00-NE25 | 8/22/2006 | 0.0-0.7 | natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, loose, slightly plastic, common fine roots, Granular/single grain. | A | SP | 3.4 | | 22000 | 15000 | 13000 | 12000 | 62000 | 8600 | Dow |
| RN-305+00-NE25 | 8/22/2006 | 0.7-2.2 | natural levee | 10YR 4/2 dark grayish brown , moist, single grain, moist, loose, Non-plastic, fewroots | C | SP | 2.9 | 16 | 16000 | 5400 | 6100 | 4600 | 32000 | 4500 | Dow |
| RN-305+00-NE25 | 8/22/2006 | 2.2-3.4 | natural levee | 10YR 4/2 dark grayish brown , moist, single grain, moist, loose, Non-plastic, fewroots | C | SP | 4.3 | 11 | 2000 | 980 | 830 | 640 | 4500 | 610 | Dow |
| RN-305+00-NE25 | 8/22/2006 | 3.4-4.8 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots, Granular/subangular blocky. | Ab | SM | 9.1 | <5 | 110 | 46 | 49 | 43 | 250 | 38 | Dow |
| RN-305+00-NE25 | 8/22/2006 | 4.8-5.2 | natural levee | 10YR 3/4 dark yellowish brown loam, moist, moist, friable, moderately plastic, fewroots, Loam/clay loam. Horizon Btb. | -- | ML/CL | 7.6 | <4 | 100 | 48 | 47 | 42 | 240 | 35 | Dow |
| RN-305+00-NE25 | 8/22/2006 | 5.2-6.3 | natural levee | 10YR 3/4 dark yellowish brown loam, moist, moist, friable, moderately plastic, fewroots, Loam/clay loam. Horizon Btb. | -- | ML/CL | 11.2 | <4 | 20 | 8 | 7 | 6 | 41* | <10* | Dow |
| RN-305+00-NE25 | 10/19/2006 | 6.3-7.4 | natural levee | 10YR 3/4 dark yellowish brown silty clay loam, dry, subangular blocky, dry, slightly hard, moderately plastic, few fine roots, white freshwater shells at 7.0' | C2 | ML | 14.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-305+00-NE25 | 10/19/2006 | 7.4-8.6 | natural levee | 10YR 3/4 dark yellowish brown silty clay loam, dry, subangular blocky, dry, slightly hard, moderately plastic, few fine roots, white freshwater shells at 7.0' | C2 | ML | 14.8 | <4 | 28 | 12 | 12 | 15 | 68 | 11 | Alta |
| RN-305+00-NE45 | 8/22/2006 | 0.0-0.9 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, Single grain. | A | SM | 24.4 | 36 | 25000 | 9300 | 10000 | 8700 | 53000 | 7400 | Dow |
| RN-305+00-NE45 | 8/22/2006 | 0.9-2.4 | intermediate terrace | 10YR 4/2 dark grayish brown loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, very friable, moderately plastic, few fine roots | B1 | SM | 13.8 | 30 | 26000 | 11000 | 12000 | 10000 | 59000 | 8400 | Dow |
| RN-305+00-NE45 | 8/22/2006 | 2.4-3.3 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, Clay loam/clay. | Bt2 | ML/CL | 17.5 | <6 | 93 | 46 | 46 | 38 | 220 | 35 | Dow |
| RN-305+00-NE45 | 8/22/2006 | 3.3-4.2 | intermediate terrace | 10YR 4/1 dark gray clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, moist, firm, moderately plastic, common medium roots, Clay loam/clay. | Bt3 | ML/CL | 14.3 | <4 | 29 | 11 | 10 | 9 | 58 | 10 | Dow |
| RN-305+00-NE45 | 8/22/2006 | 4.2-5.2 | intermediate terrace | 10YR 4/1 dark gray clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, moist, firm, moderately plastic, common medium roots, Clay loam/clay. | Bt3 | ML/CL | 12.5 | <4 | 10 | 5 | 4 | 5 | 24* | <10* | Dow |
| RN-305+00-NE45 | 10/19/2006 | 5.2-6.3 | intermediate terrace | 10YR 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic, sulphur odor, black staining at 5.7-5.8' due iron and manganese redox condition | C | CL | 17.8 | <4 | 22 | 9 | 7 | 7 | 46* | <10* | Alta |
| RN-305+00-NE45 | 10/19/2006 | 6.3-7.4 | intermediate terrace | 10YR 4/2 dark grayish brown clay, common 10YR 5/8 yellowish brown mottle, <15% gravel, wet, massive, moist, firm, moderately plastic, sulphur odor, angular gravel, trace white freshwater shells | C | CL | 15.9 | <4 | 6 | <4 | <4 | <4 | <20* | <10* | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+00-NE80 | 8/22/2006 | 0.0-1.6 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, Single grain. | A | SM | 8.2 | <4 | 77 | 41 | 39 | 45 | 200 | 30 | Dow |
| RN-305+00-NE80 | 8/22/2006 | 1.6-2.9 | high terrace | 10YR 3/4 dark yellowish brown , moist, single grain, moist, very friable, Non-plastic, fewroots | C1 | SP | 6.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-305+00-NE80 | 8/22/2006 | 2.9-4.0 | high terrace | 5YR 5/4 reddish brown , firm, moderately plastic, fewroots | C2 | CL | 18.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 0.0-1.0 | historic natural levee | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 15.2 | 19 | 30000 | 10000 | 12000 | 10000 | 62000 | 8700 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 0.0-1.0 Lab Duplicate | historic natural levee | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | SM | 15.1 | 20 | 28000 | 11000 | 12000 | 11000 | 62000 | 8700 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 1.0-2.4 | historic natural levee | 10YR 4/4 dark yellowish brown sandy loam, dry, granular, dry, slightly hard, slightly plastic, few medium roots | C1 | SM | 14 | <4 | 2100 | 840 | 860 | 640 | 4400 | 610 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 2.4-3.3 | historic natural levee | 10YR 4/6 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic | C2 | SM | 7.6 | <4 | 1300 | 370 | 460 | 250 | 2400 | 330 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 3.3-4.4 | historic natural levee | 10YR 4/6 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic, trace white freshwater shells | C2 | SM | 6.4 | <4 | 140 | 61 | 62 | 58 | 320 | 46 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 4.4-5.5 | historic natural levee | 10YR 4/6 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic | C2 | SM | 9.1 | <4 | 670 | 290 | 300 | 250 | 1500 | 210 | Dow |
| RN-305+00-SW100 | 10/10/2006 | 5.5-6.6 | historic natural levee | 10YR 4/6 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic | C2 | SM | 8.6 | <4 | 16 | 7 | 7 | 7 | 37* | <10 * | Dow |
| RN-305+00-SW100 | 10/10/2006 | 6.6-7.7 | historic natural levee | 10YR 4/6 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic | C2 | SM | 9.3 | <4 | 16 | 8 | 8 | 6 | 38* | <10 * | Dow |
| RN-305+00-SW135 | 10/10/2006 | 0.0-0.8 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | SM | 25.3 | 21 | 8900 | 3600 | 4300 | 3700 | 21000 | 2900 | Dow |
| RN-305+00-SW135 | 10/10/2006 | 0.8-2.6 | low terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | C1 | ML/CL | 21.6 | 7 | 2300 | 1100 | 1100 | 990 | 5500 | 760 | Dow |
| RN-305+00-SW135 | 10/10/2006 | 2.6-3.3 | low terrace | 10YR 3/4 dark yellowish brown clay loam, dry, subangular blocky, dry, hard, moderately plastic, few fine roots | C2 | ML/CL | 18.3 | <4 | 510 | 230 | 230 | 210 | 1200 | 160 | Dow |
| RN-305+00-SW135 | 10/10/2006 | 3.3-4.4 | low terrace | 10YR 3/4 dark yellowish brown clay loam, dry, subangular blocky, dry, hard, moderately plastic, few fine roots, trace freshwater shells | C2 | ML/CL | 13.1 | <4 | 23 | 11 | 11 | 10 | 55 | <10 * | Dow |
| RN-305+00-SW135 | 10/10/2006 | 4.4-5.5 | low terrace | 10YR 3/4 dark yellowish brown clay loam, dry, subangular blocky, dry, hard, moderately plastic, few fine roots, trace freshwater shells | C2 | ML/CL | 15.4 | <4 | 8 | 4 | 4 | <4 | <20 * | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+00-SW210 | 10/10/2006 | 0.0-1.2 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots, estimated A horizon depth due to limited recovery in second sample tube interval | A | SM | 27.1 | 19 | 4700 | 2300 | 2300 | 2200 | 12000 | 1600 | Dow |
| RN-305+00-SW210 | 10/10/2006 | 1.2-3.3 | high terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, subangular blocky, dry, moderately hard, slightly plastic, few fine roots | C1 | SM | 9.2 | <4 | 85 | 44 | 43 | 46 | 220 | 32 | Dow |
| RN-305+00-SW210 | 10/10/2006 | 3.3-4.2 Lab Duplicate | high terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, subangular blocky, dry, moderately hard, slightly plastic, few fine roots | C1 | SM | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-305+00-SW210 | 10/10/2006 | 3.3-4.2 | high terrace | 10YR 3/6 dark yellowish brown loamy sand, dry, subangular blocky, dry, moderately hard, slightly plastic, few fine roots | C1 | SM | 9 | <4 | 7 | 4 | <4 | <4 | <20 * | <10 * | Dow |
| RN-305+00-SW210 | 10/10/2006 | 4.2-4.4 | high terrace | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic, trace white freshwater snail shells | C2 | SP | 10.2 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RN-305+00-SW275 | 10/10/2006 | 0.0-1.1 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML/CL | 23.6 | 8 | 2300 | 1100 | 1100 | 1100 | 5700 | 800 | Dow |
| RN-305+00-SW275 | 10/10/2006 | 1.1-2.3 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML/CL | 18.2 | <4 | 32 | 16 | 15 | 14 | 77 | 13 | Dow |
| RN-305+00-SW275 | 10/10/2006 | 2.3-3.3 | low terrace | 10YR 4/3 brown silty clay, few 10YR 4/6 dark yellowish brown mottle, moist, granular, moist, firm, moderately plastic, few fine roots | C | ML/CL | 14.9 | <4 | 8 | <4 | <6 LISR | <14 LISR | <32 * | <10 * | Dow |
| RN-305+00-SW275 | 10/10/2006 | 3.3-4.4 | low terrace | 10YR 4/3 brown silty clay, few 10YR 4/6 dark yellowish brown mottle, moist, granular, moist, firm, moderately plastic, few fine roots, wet @ 3.5' | C | ML/CL | 18.1 | <4 | <4 | <4 | <4 | <8 LISR | <24 | <10 | Dow |
| RN-305+00-SW275 | 10/10/2006 | 4.4-5.5 | low terrace | 10YR 4/3 brown silty clay, few 10YR 4/6 dark yellowish brown mottle, wet, granular, moist, firm, moderately plastic, few fine roots, trace white freshwater shells | C | ML/CL | 21.1 | <4 | 15 | 9 | 8 | 7 | 39* | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|--------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+00-SW30 | 10/10/2006 | 0.0-1.1 | high terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, few medium roots | A | SM | 19.7 | 41 | 2500 | 1100 | 1200 | 1400 | 6200 | 910 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 1.1-2.1 | high terrace | 10YR 3/3 dark brown loam, moist, granular, moist, friable, moderately plastic, few medium roots | A | SM | 14 | 11 | 7500 | 6100 | 2800 | 4000 | 20000 | 2400 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 2.1-3.3 | high terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 5.2 | 33 | 26000 | 8200 | 10000 | 7200 | 52000 | 7400 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 3.3-4.0 | high terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, coarse root fragment | C1 | SP | 6.2 | <4 | 1500 | 730 | 650 | 570 | 3400 | 470 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 4.0-5.5 | high terrace | 10YR 3/4 dark yellowish brown loam, few 5YR 3/4 dark reddish brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic, few medium roots | C2 | SM | 10.2 | <4 | 77 | 35 | 34 | 32 | 180 | 26 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 5.5-6.6 | high terrace | 10YR 3/4 dark yellowish brown loam, few 5YR 3/4 dark reddish brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic, few medium roots | C2 | SM | 17.5 | <4 | 29 | 15 | 14 | 14 | 73 | 12 | Dow |
| RN-305+00-SW30 | 10/10/2006 | 6.6-7.7 | high terrace | 10YR 3/4 dark yellowish brown loam, few 5YR 3/4 dark reddish brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic, few medium roots | C2 | SM | 18 | <4 | 27 | 18 | 15 | 17 | 76 | 12 | Dow |
| RN-305+00-SW520 | 10/10/2006 | 0.0-1.1 | wetland | 10YR 3/2 very dark grayish br loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots, few white freshwater shells | A | ML | 38.1 | 7 | 1700 | 870 | 800 | 780 | 4100 | 570 | Dow |
| RN-305+00-SW520 | 10/10/2006 | 0.0-1.1 Lab Duplicate | wetland | 10YR 3/2 very dark grayish br loam, few 10YR 5/6 yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots, few white freshwater shells | A | ML | 39.9 | 8 | 1000 | 450 | 440 | 420 | 2400 | 330 | Dow |
| RN-305+00-SW520 | 10/10/2006 | 1.1-2.7 | wetland | 10YR 3/2 very dark grayish br silty clay, few 10YR 6/8 brownish yellow mottle, <15% gravel, wet, massive, moist, friable, moderately plastic, few fine roots, subrounded gravel at 1.6' trace white freshwater shells | C1 | ML/CL | 31.2 | <4 | 160 | 82 | 75 | 86 | 400 | 56 | Dow |
| RN-305+00-SW520 | 10/10/2006 | 2.7-3.3 | wetland | 10YR 2/1 black, wet, "black charred wood, partially decomposed" | -- | -- | 77.5 | <7 | 730 | 360 | 360 | 300 | 1700 | 250 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-----------------------------|--------------------|----------------------|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-305+05-NE25 | 11/2/2006 | 0.0-1.1 | natural levee | | -- | -- | 13.3 | 20 | 2900 | 1100 | 1100 | 1100 | 6100 | 840 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 1.1-2.2 | natural levee | | -- | -- | 7.7 | 18 | 6800 | 3400 | 2700 | 3200 | 16000 | 2100 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 2.2-3.4 | natural levee | | -- | -- | 5 | 7 | 27000 | 15000 | 10000 | 9100 | 62000 | 7900 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 3.4-4.4 | natural levee | | -- | -- | 10 | <4 | 1000 | 340 | 320 | 260 | 1900 | 260 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 4.4-5.2 | natural levee | | -- | -- | 11.3 | <4 | 54 | 23 | 21 | 48 | 150 | 21 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 5.2-6.2 | natural levee | | -- | -- | 12 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 6.2-8.0 Field Duplicate | natural levee | | -- | -- | 13.4 | <4 | 10 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-305+05-NE25 | 11/2/2006 | 6.2-8.0 | natural levee | | -- | -- | 12.9 | <5 ^{LISR} | 6 | <4 | <4 | <4 | <21 * | <10 * | Alta |
| RN-305+05-NE25 | 11/2/2006 | 8.0-9.5 Field Duplicate | natural levee | | -- | -- | 12 | <4 | 240 | 120 | 110 | 140 | 610 | 84 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 8.0-9.5 | natural levee | | -- | -- | 11.4 | <4 | 200 | 88 | 77 | 87 | 450 | 62 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 9.5-11.5 | natural levee | | -- | -- | 12.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 9.5-11.5 Field Duplicate | natural levee | | -- | -- | 12.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-305+05-NE25 | 11/2/2006 | 11.5-12.0 | natural levee | 3.3' recovery | 4 | -- | 20.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-310+00-NE150 | 11/4/2006 | 0.0-0.2 | high terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 18.4 | 10 | 740 | 300 | 250 | 310 | 1600 | 220 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 0.2-1.7 | high terrace | 10YR 4/4 dark yellowish brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 13.8 | <4 | 420 | 180 | 150 | 150 | 890 | 120 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 1.7-2.6 | high terrace | 10YR 5/3 brown loamy sand, common 10YR 5/8 yellowish brown mottle, <15% gravel, moist, granular, moist, friable, slightly plastic, White freshwater shells | C2 | SW | 11.5 | <4 | 46 | 19 | 16 | 18 | 99 | 15 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 2.6-3.0 | high terrace | 10YR 4/3 brown loamy sand, few 10YR 5/8 yellowish brown mottle, <15% gravel, moist, granular, moist, friable, slightly plastic | C3 | SW | 14.9 | <4 | 6300 | 2300 | 2000 | 1600 | 12000 | 1600 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 3.0-3.6 | high terrace | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 6.9 | <11 | 54000 | 32000 | 21000 | 24000 | 130000 | 17000 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 3.6-4.0 | high terrace | 10YR 3/3 dark brown sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C5 | SM | 13.9 | 14 | 82000 | 32000 | 26000 | 22000 | 160000 | 21000 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 4.0-4.4 | high terrace | 10YR 4/4 dark yellowish brown fine sand, few 10YR 5/8 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic | C6 | SP | 7.7 | <4 | 6200 | 2300 | 1900 | 1500 | 12000 | 1500 | Alta |
| RN-310+00-NE150 | 11/4/2006 | 4.4-5.5 | high terrace | 10YR 4/3 brown sandy loam, few 10YR 5/8 yellowish brown mottle, moist, granular, moist, friable, slightly plastic | C7 | SM | 14 | <4 | 1400 | 450 | 380 | 320 | 2600 | 330 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|------------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-311+00-NE15 | 11/2/2006 | 0.0-0.4 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots, 2.1' recovery | AC7 | SM | 16.6 | 22 | 11000 | 4300 | 3500 | 3900 | 22000 | 2900 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 0.4-1.8 | natural levee | 10YR 3/3 dark brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | C1 | SM | 9 | 10 | 39000 | 18000 | 15000 | 17000 | 88000 | 12000 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 1.8-4.0 | natural levee | 10YR 3/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | C2 | SM | 7.7 | <4 | 2300 | 520 | 610 | 370 | 3800 | 510 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 4.0-6.5 | natural levee | 10YR 3/4 dark yellowish brown sandy loam, <15% gravel, moist, granular, moist, friable, slightly plastic, common fine roots, trace white freshwater shells at 5.0' | C2 | SM | 9.1 | <4 | 390 | 150 | 150 | 130 | 820 | 110 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 4.0-6.5 Field Duplicate | natural levee | 10YR 3/4 dark yellowish brown sandy loam, <15% gravel, moist, granular, moist, friable, slightly plastic, common fine roots, trace white freshwater shells at 5.0' | C2 | SM | 8.9 | <4 | 390 | 160 | 140 | 120 | 800 | 110 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 6.5-8.0 | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots, trace freshwater shells | C3 | SM | 7.3 | <4 | 17 | 5 | 6 | 5 | 33* | <10* | Alta |
| RN-311+00-NE15 | 11/2/2006 | 6.5-8.0 Field Duplicate | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots, trace freshwater shells | C3 | SM | 7.4 | <4 | 14 | 4 | 4 | 4 | 27* | <10* | Alta |
| RN-311+00-NE15 | 11/2/2006 | 8.0-10.0 | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | C3 | SM | 9.9 | <4 | 2400 | 1100 | 860 | 930 | 5300 | 690 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 8.0-10.0 Field Duplicate | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | C3 | SM | 9.8 | <4 | 1300 | 480 | 440 | 390 | 2600 | 340 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 10.0-12.0 Field Duplicate | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | C3 | SM | 10.5 | <4 | 47 | 8 | 11 | 6 | 72 | 12 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 10.0-12.0 | natural levee | 10YR 4/6 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, few fine roots | C3 | SM | 11 | <4 | 230 | 24 | 36 | 16 | 300 | 42 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 12.0-12.5 | natural levee | 10YR 4/6 dark yellowish brown and 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, quarter of interval is similar to previously described horizon | C3 | SP | 9.1 | <4 | 4600 | 1700 | 1400 | 1200 | 8800 | 1200 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 12.5-12.9 | natural levee | 10YR 4/6 dark yellowish brown sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic | C4 | ML | 17.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 12.9-14.8 | natural levee | 10YR 5/4 yellowish brown sandy loam, few 7.5YR 5/6 strong brown mottle, moist, subangular blocky, moist, friable, moderately plastic | C5 | SM | 19.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 14.8-16.8 | natural levee | 10Y 4/1 dark greenish gray silt loam, moist, subangular blocky, moist, friable, moderately plastic, >50% gravel from 16.6-16.8' | Cg6 | ML | 19 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-311+00-NE15 | 11/2/2006 | 16.8-18.0 | natural levee | 10Y 4/1 dark greenish gray clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, white freshwater shells | Cg7 | ML/CL | 10.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-311+00-NE15 | 11/2/2006 | 18.0-20.0 | natural levee | 10Y 4/1 dark greenish gray clay loam, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, white freshwater shells | Cg7 | ML/CL | 10.2 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-316+00-IC-C | 10/11/2006 | 0.0-0.3 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Very few angular glossy course sand Sub-rounded grains Well sorted | 3 | SP | 3.2 | <4 | 19 | 4 | 4 | 6 | 34* | <10 * | Alta |
| RN-316+00-IC-C | 10/11/2006 | 0.3-0.8 | in-channel | 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, Few course sand Very few medium fine gravel Very few angular glossy course black sand Sub-rounded grains Somewhat well sorted | 3 | SP | 8.5 | <4 | 43 | 8 | 7 | 14 | 71 | 11 | Alta |
| RN-316+00-IC-C | 10/11/2006 | 0.8-1.6 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, very few medium roots, Few fine gravel Few shell fragments Very few angular glossy black course sand Sub rounded grains | 3 | SM | 10.9 | <4 | 28 | 7 | 7 | 18 | 59 | 10 | Alta |
| RN-316+00-IC-NE | 10/11/2006 | 0.0-0.4 | in-channel | 10YR 4/2 dark grayish brown fine sand, single grain, moist, loose, Non-plastic, very few medium roots, Very few course sand Very few shell fragment Very few angular glossy black course sand Well sorted | 3 | SP | 30.3 | <4 | 88 | 300 | 73 | 650 | 1100 | 120 | Alta |
| RN-316+00-IC-NE | 10/11/2006 | 0.4-1.2 | in-channel | 10YR 4/2 dark grayish brown sand, single grain, moist, loose, Non-plastic, Commom, fine, medium gravel Few shell fragments Few, angular, glossy, black, course sand Sub-rounded, sub-angular grains | 3 | SM | 11.7 | <4 | 39 | 10 | 9 | 18 | 76 | 12 | Alta |
| RN-316+00-IC-SW | 10/11/2006 | 0.0-1.1 | in-channel | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine gravel, subrounded grains, well sorted | 1 | SP | 3.8 | <4 | 9 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-316+00-IC-SW | 10/11/2006 | 1.1-1.4 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few fine gravel, few shell fragments, subrounded grains, | 2 | SM | 14.9 | <4 | 10 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RN-316+00-IC-SW | 10/11/2006 | 1.4-2.0 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, very few fine gravel, subrounded grains, very few shell fragments | 3 | SM | 14.4 | <4 | 23 | 11 | 9 | 14 | 56 | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE110 | 9/6/2006 | 0.0-1.3 | historic natural levee | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, granular/single grain | A | SW | 9.4 | 7 | 12000 | 4400 | 3900 | 3300 | 23000 | 3100 | Alta |
| RN-316+00-NE110 | 9/6/2006 | 1.3-2.3 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 7 | <4 | 170 | 66 | 58 | 50 | 350 | 48 | Alta |
| RN-316+00-NE110 | 9/6/2006 | 2.3-3.5 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 6.5 | <4 | 20 | 8 | 7 | 6 | 41* | <10* | Alta |
| RN-316+00-NE110 | 9/6/2006 | 3.5-4.4 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 6.1 | <4 | 4800 | 3900 | 2400 | 2700 | 14000 | 1700 | Alta |
| RN-316+00-NE110 | 9/6/2006 | 4.4-5.4 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 6.4 | <4 | 350 | 140 | 110 | 110 | 710 | 93 | Alta |
| RN-316+00-NE110 | 9/6/2006 | 5.4-6.4 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 7.8 | <4 | 65 | 24 | 19 | 20 | 130 | 18 | Alta |
| RN-316+00-NE110 | 9/6/2006 | 6.4-7.3 | historic natural levee | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, loose, Non-plastic, few fine roots, shell fragments at about 3.0-7.3', undecomposed plant fibers throughout horizon, <1% volume | C | SP | 6.7 | <4 | 670 | 280 | 230 | 220 | 1400 | 190 | Alta |
| RN-316+00-NE1315 | 8/29/2006 | 0.0-0.6 | low terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots, Fine granular structure, cohesive. | A | SM | 15 | 4 | 140 | 86 | 86 | 95 | 410 | 61 | Dow |
| RN-316+00-NE1315 | 8/29/2006 | 0.6-1.1 | low terrace | 10YR 4/2 dark grayish brown sandy loam, moist, subangular blocky, moist, friable, slightly plastic, very few very fine roots, Fine subangular blocky structure, cohesive. | E | SM | 10.4 | <4 | 18 | 11 | 12 | 11 | 51 | <10* | Dow |
| RN-316+00-NE1315 | 8/29/2006 | 1.1-1.5 | low terrace | 10YR 3/1 very dark gray sandy clay loam, dry, angular blocky, dry, moderately hard, moderately plastic, Medium angular structure, 10%, few clay skins on ped faces, cohesive. | Bt | SC | 8.8 | <4 | 12 | 8 | 7 | 11 | 37* | <10* | Dow |
| RN-316+00-NE1315 | 8/29/2006 | 1.5-3.3 | low terrace | 10YR 6/2 light brownish gray very fine sand, dry, single grain, dry, loose, Non-plastic, Subrounded grains, well sorted, noncohesive. | C | SP | 10.7 | <4 | 5 | <4 | <4 | 5 | <20* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE215 | 9/6/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, very friable, moderately plastic, common fine roots | A | SM | 22.4 | 45 | 37000 | 15000 | 13000 | 12000 | 76000 | 10000 | Alta |
| RN-316+00-NE215 | 9/6/2006 | 0.6-0.8 | intermediate terrace | 10YR 3/3 dark brown loamy sand, moist, single grain, moist, loose, Non-plastic, few fine roots | B1 | SW | 18 | <4 | 2100 | 960 | 760 | 780 | 4600 | 600 | Alta |
| RN-316+00-NE215 | 9/6/2006 | 0.8-3.2 | intermediate terrace | 10YR 3/3 dark brown loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, fine mottles | B2 | ML/CL | 18.4 | <4 | 89 | 32 | 30 | 30 | 180 | 26 | Alta |
| RN-316+00-NE215 | 9/6/2006 | 3.2-4.0 | intermediate terrace | 10YR 3/3 dark brown loam, few 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, fine mottles | B2 | ML/CL | 20 | <4 | 45 | 18 | 15 | 16 | 93 | 14 | Alta |
| RN-316+00-NE295 | 8/29/2006 | 0.0-0.4 | high terrace | 10YR 2/1 black sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots, cohesive | A | SM | 23.2 | 20 | 22000 | 9800 | 10000 | 9200 | 51000 | 7100 | Dow |
| RN-316+00-NE295 | 8/29/2006 | 0.4-0.8 | high terrace | 10YR 3/2 very dark grayish br loamy sand, dry, single grain, dry, loose, Non-plastic, non-cohesive, subrounded grains | Bw | SM | 18.9 | 21 | 11000 | 3700 | 3800 | 2700 | 21000 | 2900 | Dow |
| RN-316+00-NE295 | 8/29/2006 | 0.8-2.1 | high terrace | 10YR 3/2 very dark grayish br sandy loam, dry, granular, dry, slightly hard, slightly plastic, cohesive | Bw2 | SM | 15.3 | 29 | 39000 | 19000 | 18000 | 15000 | 91000 | 12000 | Dow |
| RN-316+00-NE295 | 8/29/2006 | 2.1-4.1 Lab Duplicate | high terrace | 7.5YR 3/3 dark brown loamy sand, dry, single grain, dry, loose, Non-plastic, non-cohesive, subrounded grains | C1 | SM | 12.5 | <4 | 92 | 41 | 41 | 35 | 210 | 30 | Dow |
| RN-316+00-NE295 | 8/29/2006 | 2.1-4.1 | high terrace | 7.5YR 3/3 dark brown loamy sand, dry, single grain, dry, loose, Non-plastic, non-cohesive, subrounded grains | C1 | SM | 12.3 | <4 | 110 | 50 | 49 | 41 | 250 | 35 | Dow |
| RN-316+00-NE295 | 8/29/2006 | 4.1-4.5 | high terrace | 10YR 4/3 brown sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, cohesive | 2C2 | SM | 15.2 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE30 | 9/6/2006 | 0.0-1.2 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments (undecomposed) throughout, <1% volume | C1 | SW | 6.1 | 28 | 6100 | 890 | 1200 | 780 | 9000 | 1200 | Alta |
| RN-316+00-NE30 | 9/6/2006 | 1.2-2.5 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments (undecomposed) throughout, <1% volume | C1 | SW | 8.9 | 110 | 4100 | 1500 | 1500 | 1900 | 9100 | 1300 | Alta |
| RN-316+00-NE30 | 9/6/2006 | 2.5-3.7 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments (undecomposed) throughout, <1% volume | C1 | SW | 5.7 | <24 | 8900 | 3500 | 3800 | 7400 | 24000 | 3200 | Alta |
| RN-316+00-NE30 | 9/6/2006 | 3.7-4.6 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments (undecomposed) throughout, <1% volume | C1 | SW | 4.4 | <24 | 90000 | 35000 | 32000 | 26000 | 180000 | 25000 | Alta |
| RN-316+00-NE30 | 9/7/2006 | 4.6-5.6 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments | C1 | SW | 4.4 | 11 | 47000 | 24000 | 20000 | 17000 | 110000 | 14000 | Alta |
| RN-316+00-NE30 | 9/7/2006 | 5.6-6.7 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments | C1 | SW | 3.3 | <4 | 11000 | 3300 | 3100 | 2100 | 20000 | 2600 | Alta |
| RN-316+00-NE30 | 9/7/2006 | 6.7-8.0 | natural levee | 10YR 3/3 dark brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, plant fragments | C1 | SW | 3.2 | <4 | 2300 | 690 | 820 | 570 | 4400 | 610 | Dow |
| RN-316+00-NE30 | 9/7/2006 | 8.0-8.9 | natural levee | 10YR 3/4 dark yellowish brown sandy loam, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, very friable, moderately plastic, single grain/granular, fine mottles, silt bands in sand matrix. 10' depth above but near existing river stage | C2 | SM | 13.7 | <4 | 24 | 10 | 9 | 7 | 51 | <10* | Dow |
| RN-316+00-NE30 | 9/7/2006 | 8.9-10.2 | natural levee | 10YR 3/4 dark yellowish brown sandy loam, few 10YR 4/6 dark yellowish brown mottle, moist, single grain, moist, very friable, moderately plastic, single grain/granular, fine mottles, silt bands in sand matrix. 10' depth above but near existing river stage | C2 | SM | 14.7 | <4 | 540 | 350 | 280 | 290 | 1500 | 200 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE30N | 9/6/2006 | 0.0-1.0 Lab Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, granular/single grain | A | SW | 10.8 | | 41000 | 17000 | 19000 | 14000 | 91000 | 13000 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 0.0-1.0 | intermediate terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, granular/single grain | A | SW | 10.1 | 30 | 35000 | 15000 | 27000 | 13000 | 89000 | 15000 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 1.0-2.4 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 3.8 | 11 | 16000 | 6400 | 5800 | 4700 | 33000 | 4400 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 1.0-2.4 Lab Duplicate | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 4.2 | 7 | 8400 | 6400 | 5100 | 5900 | 26000 | 3500 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 2.4-3.5 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 6.7 | <4 | 1800 | 780 | 770 | 630 | 4000 | 550 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 3.5-4.4 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 5.8 | 14 | 15000 | 2800 | 4000 | 1700 | 24000 | 3300 | Dow |
| RN-316+00-NE30N | 9/6/2006 | 4.4-5.6 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 5 | <4 | 540 | 220 | 160 | 130 | 1100 | 140 | Alta |
| RN-316+00-NE30N | 9/6/2006 | 5.6-6.6 | intermediate terrace | 10YR 3/4 dark yellowish brown sand, moist, single grain, moist, very friable, Non-plastic, few fine roots, white shells at about 4.5'-6.6', <2 mm diameter, <1% volume | C | SP | 6.2 | <4 | 5500 | 3800 | 2100 | 2800 | 14000 | 1700 | Alta |
| RN-316+00-NE30N | 11/7/2006 | 6.6-7.3 | intermediate terrace | 10YR 3/3 dark brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic | 2C | SM | 7.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RN-316+00-NE30N | 11/7/2006 | 7.3-8.0 | intermediate terrace | 10YR 3/3 dark brown loamy very fine sand, dry, single grain, dry, loose, Non-plastic | 2C | SM | 6.1 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RN-316+00-NE30N | 11/7/2006 | 8.0-9.0 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots | 3C | SM | 8.5 | <4 | 59 | 24 | 22 | 17 | 120 | 19 | Dow |
| RN-316+00-NE30N | 11/7/2006 | 9.0-10.1 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots | 3C | SM | 7.8 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RN-316+00-NE30N | 11/7/2006 | 11.1-12.0 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots | 3C | SM | 12.8 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |

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Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE30S | 9/6/2006 | 0.0-0.5 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, granular, moist, very friable, slightly plastic, common fine roots, granular/single grain | A | SW | 12.2 | 14 | 18000 | 7800 | 7800 | 6200 | 40000 | 5500 | Dow |
| RN-316+00-NE30S | 9/6/2006 | 0.5-1.2 | high terrace | 10YR 3/3 dark brown loamy sand, moist, single grain, moist, very friable, slightly plastic, common fine roots, single grain/granular | C1 | SW | 10.3 | 8 | 12000 | 5400 | 5500 | 3900 | 27000 | 3800 | Dow |
| RN-316+00-NE30S | 9/6/2006 | 1.2-3.2 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, moist, single grain, moist, very friable, slightly plastic, few fine roots, single grain/granular | C2 | SW | 9.3 | <4 | 82 | 40 | 31 | 33 | 190 | 26 | Dow |
| RN-316+00-NE30S | 9/6/2006 | 3.2-4.0 | high terrace | 10YR 3/3 dark brown sandy loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, 2Bwb...horizon subangular blocky/granular | -- | SM | 10.5 | <4 | 210 | 54 | 52 | 33 | 350 | 49 | Alta |
| RN-316+00-NE30S | 9/6/2006 | 4.0-5.5 | high terrace | 10YR 3/4 dark yellowish brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots, granular/single grain, purple stains, <1% volume | 2C3 | SW | 7.9 | <4 | 24 | 9 | 8 | 7 | 48* | <10* | Alta |
| RN-316+00-NE395 | 8/29/2006 | 0.0-0.8 | intermediate terrace | 10YR 3/2 very dark grayish br silt loam, dry, granular, dry, slightly hard, slightly plastic, few very fine roots, very fine and fine roots, cohesive | A | ML | 35.6 | 30 | 8200 | 4700 | 4700 | 4100 | 22000 | 3100 | Dow |
| RN-316+00-NE395 | 8/29/2006 | 0.8-1.5 | intermediate terrace | 10YR 4/2 dark grayish brown silty clay loam, common 7.5YR 4/4 brown mottle, dry, subangular blocky, dry, moderately hard, moderately plastic, very few fine roots, cohesive, few fine clay skins on ped faces | Bt | ML | 16.1 | <4 | 1700 | 820 | 800 | 670 | 4000 | 550 | Dow |
| RN-316+00-NE395 | 8/29/2006 | 1.5-2.5 | intermediate terrace | 10YR 4/2 dark grayish brown clay loam, many 7.5YR 5/8 strong brown mottle, dry, angular blocky, dry, very hard, very plastic, very few very fine roots, cohesive, trace charcoal, common thick clay skins on ped faces | Bt2 | CL | 16.3 | <4 | 120 | 59 | 56 | 47 | 280 | 41 | Dow |
| RN-316+00-NE395 | 8/29/2006 | 2.5-4.6 | intermediate terrace | 10YR 4/2 dark grayish brown clay, many mottle, dry, angular blocky, dry, very hard, very plastic, cohesive, few charcoal, yellowish brown mottles | C | CH | 16.7 | <4 | 20 | 11 | 11 | 9 | 50* | <10* | Dow |
| RN-316+00-NE395 | 8/29/2006 | 4.6-5.4 | intermediate terrace | 10YR 4/1 dark gray silty clay loam, common 7.5YR 4/4 brown mottle, dry, angular blocky, dry, moderately hard, moderately plastic, cohesive, trace charcoal | C2 | CL | 19 | <4 | 580 | 200 | 210 | 140 | 1100 | 160 | Dow |
| RN-316+00-NE395 | 11/29/2006 | 5.4-6.5 | intermediate terrace | 10YR 4/1 dark gray silty clay loam, common 10YR 5/8 yellowish brown mottle, wet, angular blocky, moist, firm, moderately plastic | C2 | CL | 25.7 | <4 | 20 | 8 | 9 | 7 | 44* | <10* | Dow |
| RN-316+00-NE395 | 11/29/2006 | 6.5-7.6 | intermediate terrace | 10YR 4/1 dark gray silty clay loam, common 10YR 5/8 yellowish brown mottle, wet, angular blocky, moist, firm, moderately plastic | C2 | CL | 26 | <4 | 15 | 5 | 5 | <4 | 24* | <10* | Dow |
| RN-316+00-NE495 | 8/29/2006 | 0.0-0.7 | high terrace | 10YR 3/2 very dark grayish br loamy sand, moist, single grain, moist, loose, Non-plastic, very few very fine roots, noncohesive | A | SM | 10.1 | <4 | 890 | 490 | 410 | 350 | 2100 | 290 | Dow |
| RN-316+00-NE495 | 8/29/2006 | 0.7-1.4 | high terrace | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, few concretions,noncohesive, trace coarse sand, well sorted, subrounded grains | C | SP | 5.8 | <4 | 120 | 56 | 53 | 44 | 270 | 39 | Dow |
| RN-316+00-NE495 | 8/29/2006 | 1.4-2.4 | high terrace | 10YR 6/4 light yellowish brow and 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, noncohesive, trace charcoal, well sorted, subrounded grains | C2 | SP | 8.1 | <4 | 8 | <4 | 5 | <4 | <20* | <10* | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-NE675 | 11/4/2006 | 0.0-1.1 | high terrace | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 14.5 | 4 | 110 | 61 | 50 | 71 | 300 | 44 | Alta |
| RN-316+00-NE675 | 11/4/2006 | 1.1-2.2 | high terrace | 5Y 4/3 olive sandy clay loam, few 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | SM | 14.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-316+00-NE675 | 11/4/2006 | 2.2-3.3 | high terrace | 5Y 5/3 olive clay, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, friable, moderately plastic, trace white freshwater shells | C2 | ML/CL | 18.1 | <4 | 7 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-316+00-NE885 | 8/29/2006 | 0.0-0.9 | high terrace | 10YR 3/1 very dark gray sandy loam, moist, granular, moist, friable, slightly plastic, few very fine roots, cohesive | A | SM | 16.2 | 5 | 150 | 90 | 81 | 100 | 430 | 63 | Dow |
| RN-316+00-NE885 | 8/29/2006 | 0.9-1.4 | high terrace | 10YR 3/2 very dark grayish br sandy loam, few 7.5YR 3/3 dark brown mottle, dry, subangular blocky, dry, slightly hard, slightly plastic, 10% 7.5YR 3/3 dark brown mottles cohesive | Bt | SM | 10.1 | <4 | 8 | 4 | 5 | 5 | 22* | <10 * | Dow |
| RN-316+00-NE885 | 8/29/2006 | 1.4-2.8 | high terrace | 10YR 4/1 dark gray sandy clay loam, common 7.5YR 4/6 strong brown mottle, dry, subangular blocky, dry, moderately hard, moderately plastic, 20% 7.5YR 4/6 strong brown mottles cohesive, iron concretions trace coarse sand | Bt2 | SC | 12 | <4 | <4 | <4 | <4 | <9 ^{LISR} | <25 | <10 | Dow |
| RN-316+00-NE885 | 8/29/2006 | 2.8-3.5 | high terrace | 10YR 4/2 dark grayish brown clay loam, common 7.5YR 4/6 strong brown mottle, dry, angular blocky, dry, very hard, very plastic, medium angular blocky cohesive 25% 7.5YR 4/6 strong brown mottles | C | CL | 18.6 | <4 | 5 | <4 | <4 | <8 ^{LISR} | <24 * | <10 * | Dow |
| RN-316+00-SW100 | 10/18/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 28.2 | 22 | 570 | 300 | 260 | 370 | 1500 | 220 | Alta |
| RN-316+00-SW100 | 10/18/2006 | 0.3-2.2 | intermediate terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 21.6 | <4 | 290 | 110 | 99 | 100 | 610 | 82 | Alta |
| RN-316+00-SW100 | 10/18/2006 | 2.2-2.8 | intermediate terrace | 10YR 3/4 dark yellowish brown loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | C1 | ML | 16.4 | <4 | 6 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RN-316+00-SW100 | 10/18/2006 | 2.8-3.5 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, subangular blocky, moist, firm, moderately plastic, few medium roots, apparent buried A horizon | 2Ab | ML | 19 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RN-316+00-SW100 | 10/18/2006 | 3.5-4.4 | intermediate terrace | 10YR 4/4 dark yellowish brown silty clay loam, common 10YR 5/8 yellowish brown and 5YR 3/3 dark reddish brown mottle, moist, subangular blocky, moist, firm, very plastic, few fine roots | 2C2 | ML | 15.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-316+00-SW100 | 10/18/2006 | 4.4-5.5 | intermediate terrace | 10YR 4/4 dark yellowish brown silty clay loam, common 10YR 5/8 yellowish brown and 5YR 3/3 dark reddish brown mottle, moist, subangular blocky, moist, firm, very plastic | 2C2 | ML | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-316+00-SW100 | 10/18/2006 | 5.5-6.6 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, common 10YR 5/6 yellowish brown and 5YR 3/4 dark reddish brown mottle, moist, granular, moist, firm, moderately plastic, white freshwater shells, <2% wet below 6' | 2C3 | SM | 19 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-SW175 | 10/18/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 35.4 | 34 | 1400 | 670 | 560 | 760 | 3400 | 480 | Alta |
| RN-316+00-SW175 | 10/18/2006 | 0.3-1.6 | low terrace | 10YR 3/3 dark brown clay loam, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | Bt | ML/CL | 23.6 | <4 | 180 | 84 | 69 | 81 | 410 | 56 | Alta |
| RN-316+00-SW175 | 10/18/2006 | 1.6-3.3 | low terrace | 10YR 4/2 dark grayish brown silty clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, wet below 2.7" | C | ML/CL | 22.8 | <4 | 17 | 6 | 6 | 7 | 35* | <10* | Alta |
| RN-316+00-SW290 | 10/18/2006 | 0.0-0.5 | wetland | 10YR 3/2 very dark grayish br silty clay loam, wet, granular, moist, friable, moderately plastic, common fine roots, trace white freshwater shells | A | ML | 51.4 | 44 | 2000 | 920 | 750 | 930 | 4700 | 650 | Alta |
| RN-316+00-SW290 | 10/18/2006 | 0.5-2.2 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic, few fine roots | C | CL | 37.3 | <4 | 44 | 14 | 11 | 9 | 79 | 12 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 0.0-1.1 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots | C1 | SW | 15.2 | 48 | 880 | 360 | 330 | 610 | 2200 | 330 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 1.1-2.2 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots | C1 | SW | 12.3 | 34 | 1300 | 610 | 540 | 1500 | 4000 | 550 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 2.2-3.3 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots | C1 | SW | 9.1 | 51 | 3300 | 1400 | 1200 | 2600 | 8600 | 1200 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 3.3-4.4 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots | C1 | SW | 6.6 | <4 | 2000 | 1100 | 860 | 2000 | 5900 | 750 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 4.4-5.5 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots | C1 | SW | 8.3 | 6 | 15000 | 4500 | 4200 | 4300 | 28000 | 3600 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 5.5-6.6 | natural levee | 10YR 3/3 dark brown loamy sand, dry, granular, dry, slightly hard, slightly plastic, few fine roots, 6.3-6.6' - 10YR 4/4 sand layer, SP, dry, nonplastic, loose | C1 | SW | 6.6 | 13 | 50000 | 20000 | 16000 | 15000 | 100000 | 13000 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 6.6-7.7 | natural levee | 10YR 3/3 dark brown loamy sand, few 10YR 5/8 yellowish brown mottle, dry, granular, dry, slightly hard, slightly plastic, few fine roots, wood fragment @ 7.1' and at 7.7', 0.05' thickness mottles are below 6.6' | C1 | SW | 12.9 | 8 | 35000 | 19000 | 15000 | 17000 | 86000 | 11000 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 7.7-9.1 | natural levee | 10YR 4/3 brown fine sand, few 10YR 5/8 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, wet below 8.2' | C2 | SP | 17.3 | <4 | 3300 | 1200 | 1100 | 960 | 6500 | 860 | Alta |
| RN-316+00-SW30 | 10/18/2006 | 9.1-9.9 | natural levee | 10YR 4/2 dark grayish brown silty clay loam, common 10YR 5/8 yellowish brown and 5YR 3/3 dark reddish brown mottle, wet, subangular blocky, moist, firm, moderately plastic | C3 | ML | 26.3 | <4 | 42 | 16 | 15 | 13 | 86 | 12 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+00-SW570 | 10/18/2006 | 0.0-0.5 | wetland | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 57.2 | 17 | 350 | 190 | 160 | 260 | 980 | 140 | Alta |
| RN-316+00-SW570 | 10/18/2006 | 0.5-2.2 | wetland | 10Y 4/1 dark greenish gray silty clay loam, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic, few fine roots | C | ML | 26.9 | <4 | 14 | 6 | 5 | 5 | 31* | <10* | Alta |
| RN-316+00-T-NE850 | 9/7/2006 | 00-1.5 | tributary | 10YR 5/2 grayish brown sandy loam, few 10YR 5/6 yellowish brown mottle, wet, granular, moist, very friable, moderately plastic, few fine roots | C1 | SM | 21.2 | 6 | 10 | 5 | 6 | 12 | 39* | 11* | Alta |
| RN-316+00-T-NE850 | 9/7/2006 | 1.5-2.2 | tributary | 10YR 5/3 brown clay loam, wet, massive, moist, very firm, moderately plastic, few fine roots | C2 | ML/CL | 21.4 | <4 | 23 | 9 | 10 | 35 | 76 | 12 | Alta |
| RN-316+00-T-NE850 | 9/7/2006 | 2.2-3.2 | tributary | 10YR 5/3 brown clay loam, wet, massive, moist, very firm, moderately plastic, few fine roots | C2 | ML/CL | 12.5 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RN-316+05-NE110 | 11/2/2006 | 0.0-1.3 | historic natural levee | | 7 | -- | 13.4 | 13 | 12000 | 4800 | 4200 | 3900 | 24000 | 3200 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 1.3-2.3 | historic natural levee | | 7 | -- | 8.1 | <4 | 1400 | 390 | 380 | 210 | 2400 | 320 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 2.3-3.5 | historic natural levee | | 7 | -- | 4.3 | <4 | 520 | 310 | 210 | 190 | 1200 | 160 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 3.5-4.4 | historic natural levee | | 7 | -- | 6.5 | 5 | 9300 | 2400 | 2500 | 1700 | 16000 | 2100 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 4.4-5.4 | historic natural levee | | 7 | -- | 5.3 | <4 | 5 | <4 | <4 | 6 | <20* | <10* | Alta |
| RN-316+05-NE110 | 11/2/2006 | 5.4-6.4 | historic natural levee | | 7 | -- | 3.7 | <4 | 35 | 15 | 13 | 13 | 77 | 12 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 6.4-7.3 | historic natural levee | | 7 | -- | 5.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 7.3-9.6 | historic natural levee | | -- | -- | 8.5 | <4 | 350 | 150 | 140 | 140 | 780 | 110 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 9.6-10.5 | historic natural levee | | -- | -- | 15.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RN-316+05-NE110 | 11/2/2006 | 10.5-12.0 | historic natural levee | | -- | -- | 14.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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|---|-----------------|------------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-316+05-NE30 | 11/7/2006 | 10.2-11.6 Field Duplicate | natural levee | 10YR 5/4 yellowish brown and 10YR 4/3 brown fine sand, common 7.5YR 4/6 strong brown mottle, moist, structureless, moist, loose, Non-plastic, interbedded fine sand (10YR 5/4) and fine sandy loam (10YR 4/3) Grades into next horizon but too thin to be a distinct transitional horizon | C3 | SP | 14.2 | <4 | 340 | 130 | 130 | 86 | 690 | 97 | Dow |
| RN-316+05-NE30 | 11/7/2006 | 10.2-11.6 | natural levee | 10YR 5/4 yellowish brown and 10YR 4/3 brown fine sand, common 7.5YR 4/6 strong brown mottle, moist, structureless, moist, loose, Non-plastic, interbedded fine sand (10YR 5/4) and fine sandy loam (10YR 4/3) Grades into next horizon but too thin to be a distinct transitional horizon | C3 | SP | 13.7 | <4 | 450 | 160 | 150 | 92 | 850 | 120 | Dow |
| RN-316+05-NE30 | 11/7/2006 | 11.6-12.6 | natural levee | 2.5Y 4/1 dark gray sandy clay loam, wet, structureless, moist, firm, moderately plastic, irregular thin layers of fine sand throughout Decomposing wood fragments throughout Horizon divided by sample analysis | Cg | CL | 33.7 | <4 | 48 | 37 | 27 | 23 | 140 | 20 | Dow |
| RN-316+05-NE30 | 11/7/2006 | 12.6-13.6 | natural levee | 2.5Y 4/1 dark gray sandy clay loam, wet, structureless, moist, firm, moderately plastic, irregular thin layers of fine sand throughout Decomposing wood fragments throughout Horizon divided by sample analysis | Cg | CL | 34 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RN-316+05-NE30 | 11/7/2006 | 13.6-15.0 Field Duplicate | natural levee | 2.5Y 4/1 dark gray sandy clay loam, wet, structureless, moist, firm, moderately plastic, irregular thin layers of fine sand throughout Decomposing wood fragments throughout Horizon divided by sample analysis | Cg | CL | 33.3 | <4 | 15 | 5 | 4 | <4 | 24* | <10* | Dow |
| RN-316+05-NE30 | 11/7/2006 | 13.6-15.0 | natural levee | 2.5Y 4/1 dark gray sandy clay loam, wet, structureless, moist, firm, moderately plastic, irregular thin layers of fine sand throughout Decomposing wood fragments throughout Horizon divided by sample analysis | Cg | CL | 32.6 | <4 | 13 | 6 | 5 | <4 | 23* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach N

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RN-318+00-SW10 | 11/6/2006 | 0.0-1.2 | natural levee | 10YR 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few fine roots | A | SM | 16 | 81 | 2500 | 1000 | 890 | 1600 | 6100 | 860 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 1.2-2.0 | natural levee | 10YR 3/1 very dark gray loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots | Bw | SM | 14.4 | 72 | 2700 | 1500 | 1900 | 4200 | 10000 | 1500 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 2.0-2.9 | natural levee | 10YR 3/1 very dark gray loamy very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots | Bw | SM | 10.5 | <10 | 10000 | 3400 | 2900 | 3800 | 20000 | 2600 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 2.9-4.0 | natural levee | 10YR 4/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, subrounded grains well sorted | C | SP | 6.8 | <8 | 27000 | 13000 | 11000 | 10000 | 61000 | 8000 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 4.0-5.2 | natural levee | 10YR 4/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, subrounded grains well sorted | C | SP | 8.6 | 13 | 47000 | 19000 | 16000 | 14000 | 96000 | 13000 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 5.2-6.6 | natural levee | 10YR 5/4 yellowish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, very few coarse roots, subrounded grains | C2 | SM | 12.7 | <4 | 3200 | 970 | 910 | 700 | 5800 | 760 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 6.6-7.5 | natural levee | 10YR 3/2 very dark grayish br and 10YR 5/1 gray sandy clay loam, common 5YR 3/4 dark reddish brown mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine roots | 2C | SC | 19.8 | <4 | 97 | 35 | 30 | 29 | 190 | 27 | Alta |
| RN-318+00-SW10 | 11/6/2006 | 7.5-8.8 | natural levee | 10YR 4/1 dark gray silty clay loam, wet, subangular blocky, moist, firm, moderately plastic | 3C | CL | 23.4 | <4 | 270 | 120 | 92 | 98 | 570 | 77 | Alta |
| RN-319+00-T-NE135 | 9/7/2006 | 0.0-1.0 | tributary | 10YR 5/2 grayish brown sandy loam, few 10YR 5/6 yellowish brown mottle, wet, granular, moist, very friable, moderately plastic, few fine roots, Mottles, few, fine. Plant fiber, <2% volume. | C1 | SM | 31 | 92 | 2500 | 940 | 940 | 1300 | 5800 | 860 | Alta |
| RN-319+00-T-NE135 | 9/7/2006 | 1.0-2.4 | tributary | 10YR 5/2 grayish brown silt loam, wet, granular, moist, very friable, moderately plastic, few fine roots, Silt loam/loam Mottles, few, fine. Sample 1.1-2.4' (40% recovery). | C2 | ML | 22.8 | <4 | <4 | <4 | <4 | <10 ^{LISR} | <26 | <10 | Dow |

NOTES:

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"--" indicates data that was not collected for the given soil sample

DATA FLAGS:

Asterisk (*) indicates estimated concentration.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE10 | 9/6/2006 | 0.0-0.2 | natural levee | 10YR 3/1 very dark gray fine sand, moist, single grain, moist, loose, Non-plastic, common fine roots, Common very fine, fine and medium roots | A | SP | 12.3 | 6 | 750 | 260 | 250 | 270 | 1500 | 210 | Alta |
| RO-320+00-NE10 | 9/6/2006 | 0.2-1.1 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots | Bw | SP | 9 | 8 | 890 | 270 | 280 | 340 | 1800 | 250 | Alta |
| RO-320+00-NE10 | 9/6/2006 | 1.1-2.4 | natural levee | 10YR 4/3 brown and 10YR 4/2 dark grayish brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots, fine and very fine sand | C1 | SP | 7.8 | <4 | 1500 | 570 | 630 | 470 | 3200 | 440 | Dow |
| RO-320+00-NE10 | 9/6/2006 | 2.4-3.0 | natural levee | 10YR 5/2 grayish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 5.1 | <4 | 170 | 81 | 100 | 110 | 470 | 70 | Dow |
| RO-320+00-NE10 | 9/6/2006 | 3.0-3.7 | natural levee | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and very fine sand | C3 | SP | 4.1 | <4 | 60 | 22 | 29 | 28 | 140 | 22 | Dow |
| RO-320+00-NE10 | 9/6/2006 | 3.7-4.5 | natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 5.3 | <4 | 25 | 11 | 14 | 13 | 62 | 11 | Dow |
| RO-320+00-NE10 | 9/6/2006 | 4.5-5.2 | natural levee | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C5 | SP | 4.5 | <4 | 11 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RO-320+00-NE10 | 9/6/2006 | 5.2-6.4 | natural levee | 10YR 5/3 brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, freshwater snail shells | C6 | SP | 3.9 | <4 | 27 | 13 | 16 | 15 | 71 | 13 | Dow |
| RO-320+00-NE10 | 9/6/2006 | 5.2-6.4 Lab Duplicate | natural levee | 10YR 5/3 brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, freshwater snail shells | C6 | SP | 4 | <4 | 15 | 6 | 7 | 8 | 36* | <10 * | Dow |
| RO-320+00-NE10 | 9/6/2006 | 6.4-7.3 | natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C7 | SP | 6.5 | <4 | 13 | 5 | 6 | 6 | 30* | <10 * | Dow |
| RO-320+00-NE10 | 9/6/2006 | 7.3-8.8 | natural levee | 10YR 4/4 dark yellowish brown and 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, 10 YR 4/4 very fine sand 10YR 5/4 fine sand | C8 | SP | 6.6 | <4 | 11 | 4 | 4 | 5 | 25* | <10 * | Alta |
| RO-320+00-NE1130 | 9/7/2006 | 0.0-0.8 | high terrace | 10YR 3/1 very dark gray loamy fine sand, moist, granular, moist, very friable, Non-plastic | A | SP | 11.9 | <4 | 150 | 82 | 82 | 99 | 410 | 60 | Dow |
| RO-320+00-NE1130 | 9/7/2006 | 0.8-1.2 | high terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic | E | SP | 5.5 | <4 | 8 | 4 | 4 | 6 | 23* | <10 * | Dow |
| RO-320+00-NE1130 | 9/7/2006 | 1.2-2.4 | high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, contains oxidized gravel - perhaps concretious | Bs | SP | 7.7 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RO-320+00-NE1130 | 9/7/2006 | 2.4-3.7 | high terrace | 10YR 6/2 light brownish gray sand, moist, single grain, moist, loose, Non-plastic, oxidized gravel | C1 | SP | 12.3 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |
| RO-320+00-NE1130 | 9/7/2006 | 3.7-4.4 | high terrace | 10YR 6/2 light brownish gray and 10R 6/3 pale red sand, wet, single grain, moist, loose, Non-plastic, also contains grey 5G 4/1 - perhaps caused by algae | C2 | SP | 15.6 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE1375 | 9/7/2006 | 0.0-0.4 | low terrace | 10YR 3/1 very dark gray loam, moist, subangular blocky, moist, friable, slightly plastic, few fine roots, SLIGHTLY TO MODERATELY PLASTIC | A | SC | 28.7 | 14 | 410 | 220 | 230 | 360 | 1200 | 180 | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 0.4-1.1 | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, common mottle, moist, subangular blocky, moist, friable, moderately plastic, few very coarse roots, COMMON MEDIUM DISTINCT MOTTLES | Bw | CL | 14.8 | <4 | 34 | 19 | 19 | 19 | 91 | 15 | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 1.1-2.2 | low terrace | 10YR 4/2 dark grayish brown sandy loam, moist, subangular blocky, moist, friable, slightly plastic, very few medium roots | C1 | SC | 16.3 | <4 | 48 | 27 | 28 | 37 | 140 | 22 | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 2.2-2.9 | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, common mottle, moist, moist, firm, moderately plastic, COMMON MEDIUM FAINT MOTTLES | C2 | CL | 13.9 | <4 | <4 | <4 | <4 | <9 | <25 | <10 | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 2.2-2.9 Lab Duplicate | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, common mottle, moist, moist, firm, moderately plastic, COMMON MEDIUM FAINT MOTTLES | C2 | CL | 14.1 | <4 | <4 | <5 | <5 | <13 | <31 | <10 | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 2.9-3.8 | low terrace | 10YR 6/2 light brownish gray sandy loam, common 10YR 5/8 yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic | C3 | SC | 13.6 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RO-320+00-NE1375 | 9/7/2006 | 3.8-4.4 | low terrace | 10YR 4/1 dark gray sandy clay loam, few mottle, moist, subangular blocky, moist, firm, moderately plastic, FEW COARSE DISTINCT MOTTLES MODERATELY TO VERY PLASTIC | C4 | CL | 18.8 | <4 | 180 | 100 | 98 | 140 | 520 | 73 | Dow |
| RO-320+00-NE1375 | 10/19/2006 | 4.4-5.5 | low terrace | 10YR 4/1 dark gray clay, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic, few concretions,concretion-weathering rock fragment | C5 | CL | 18.5 | <4 | 15 | 7 | 6 | 6 | 34* | <10 * | Alta |
| RO-320+00-NE1375 | 10/19/2006 | 5.5-6.6 | low terrace | 10YR 4/1 dark gray clay, few 10YR 5/8 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | C5 | CL | 12.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE160 | 9/6/2006 | 0.0-0.4 | high terrace | 10YR 3/2 very dark grayish br silt loam, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots | A | ML | 33.2 | 35 | 8300 | 3300 | 2700 | 3400 | 18000 | 2300 | Alta |
| RO-320+00-NE160 | 9/6/2006 | 0.4-2.2 | high terrace | 10YR 4/4 dark yellowish brown silty clay loam, moist, subangular blocky, moist, friable, moderately plastic, friable to firm | Bt | ML | 20.9 | <4 | 1800 | 760 | 560 | 560 | 3700 | 470 | Alta |
| RO-320+00-NE160 | 9/6/2006 | 2.2-3.1 | high terrace | 10YR 4/3 brown silty clay loam, moist, subangular blocky, moist, friable, moderately plastic | C1 | ML | 20.2 | <4 | 11 | 4 | <4 | <4 | <20 * | <10 * | Dow |
| RO-320+00-NE160 | 9/6/2006 | 3.1-4.2 | high terrace | 10YR 4/3 brown silty clay loam, moist, subangular blocky, moist, friable, moderately plastic, freshwater shells | C2 | ML | 19.9 | <4 | 74 | 39 | 34 | 34 | 180 | 27 | Dow |
| RO-320+00-NE160 | 9/6/2006 | 4.2-5.3 | high terrace | 10YR 4/3 brown silty clay loam, few mottle, moist, subangular blocky, moist, friable, moderately plastic, few fine faint mottles | C3 | ML | 18.9 | <4 | 18 | 7 | 6 | 7 | 38* | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE2000 | 10/19/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, granular, moist, friable, moderately plastic, common very fine roots, Few fine roots. | A2 | CL | 40.5 | 17 | 210 | 130 | 110 | 210 | 680 | 100 | Alta |
| RO-320+00-NE2000 | 10/19/2006 | 0.4-1.1 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay loam, few 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moderate, moist, friable, moderately plastic, very few coarse roots | A/C | CL | 21.6 | <4 | 170 | 80 | 70 | 89 | 410 | 56 | Alta |
| RO-320+00-NE2000 | 10/19/2006 | 1.1-2.2 | intermediate terrace | 10YR 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic, very few fine roots, Roots only near top of horizon. | C1 | CH | 18.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE2000 | 10/19/2006 | 2.2-2.9 | intermediate terrace | 10YR 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic | C1 | CH | 19.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE2000 | 10/19/2006 | 2.9-3.3 | intermediate terrace | 10YR 4/1 dark gray and 10YR 3/1 very dark gray clay, few 10YR 4/4 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic | Cg2 | CH | 17.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE2100 | 10/19/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br sandy clay, wet, angular blocky, weak, moist, very firm, very plastic, very few very fine roots | A | CH | 16.6 | 5 | 65 | 27 | 25 | 26 | 150 | 25 | Alta |
| RO-320+00-NE2100 | 10/19/2006 | 0.8-1.4 | high terrace | 10YR 4/2 dark grayish brown sandy clay loam, wet, massive, moist, very firm, very plastic, Borders on a sandy clay. | AC | CL | 16.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE2100 | 10/19/2006 | 1.4-2.4 | high terrace | 10YR 5/2 grayish brown and 10YR 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, extremely firm, very plastic, C horizon split into two sample intervals. Irregular very small concentrations of organic matter. | C | CH | 16.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE2100 | 10/19/2006 | 2.4-3.3 | high terrace | 10YR 5/2 grayish brown and 10YR 4/2 dark grayish brown clay, common 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, extremely firm, very plastic, C horizon split into two sample intervals. Irregular very small concentrations of organic matter. | C | CH | 16.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE25 | 9/6/2006 | 0.0-0.5 | natural levee | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, Non-plastic, common very fine roots | A | SP | 13.8 | 14 | 36000 | 13000 | 13000 | 10000 | 73000 | 10000 | Dow |
| RO-320+00-NE25 | 9/6/2006 | 0.5-2.3 | natural levee | 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots | Bw | SP | 10.3 | <4 | 17000 | 6000 | 5200 | 4400 | 33000 | 4300 | Alta |
| RO-320+00-NE25 | 9/6/2006 | 2.3-3.1 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | C1 | SP | 9 | <4 | 59 | 23 | 22 | 16 | 120 | 18 | Alta |
| RO-320+00-NE25 | 9/6/2006 | 3.1-4.4 | natural levee | 10YR 4/4 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, loamy fine and very fine sand | C2 | SP | 8.7 | <4 | 430 | 150 | 140 | 120 | 850 | 110 | Alta |
| RO-320+00-NE25 | 10/19/2006 | 4.4-5.5 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | C3 | SW | 10.4 | <4 | 100 | 45 | 38 | 38 | 220 | 31 | Alta |
| RO-320+00-NE25 | 10/19/2006 | 5.5-6.6 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots | C3 | SW | 11.5 | <4 | 1000 | 440 | 380 | 310 | 2100 | 290 | Alta |
| RO-320+00-NE25 | 10/19/2006 | 6.6-7.7 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots, trace white freshwater shells | C3 | SW | 16.3 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-320+00-NE25 | 10/19/2006 | 7.7-8.6 | natural levee | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, slightly plastic, few fine roots, trace white freshwater shells | C3 | SW | 19.6 | <4 | 96 | 41 | 36 | 34 | 210 | 30 | Alta |
| RO-320+00-NE25 | 10/19/2006 | 8.6-9.9 | natural levee | 10YR 4/3 brown loamy fine sand, few 10YR 5/6 yellowish brown mottle, wet, single grain, moist, loose, Non-plastic, trace white freshwater shells | C4 | SW | 20.3 | <4 | 10 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-320+00-NE40 | 9/6/2006 | 0.0-0.3 | historic natural levee | 10YR 3/1 very dark gray loamy fine sand, moist, granular, moist, very friable, slightly plastic, very few fine roots | A | SP | 19.6 | 19 | 13000 | 11000 | 6500 | 5900 | 36000 | 4600 | Dow |
| RO-320+00-NE40 | 9/6/2006 | 0.3-1.1 | historic natural levee | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic | A/B | SP | 10.4 | 13 | 11000 | 4900 | 4800 | 4400 | 25000 | 3500 | Dow |
| RO-320+00-NE40 | 9/6/2006 | 1.1-2.6 | historic natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, freshwater snail shells | Bw | SP | 7.5 | <4 | 220 | 84 | 74 | 71 | 450 | 62 | Alta |
| RO-320+00-NE40 | 9/6/2006 | 2.6-3.7 | historic natural levee | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 3 | <4 | 160 | 92 | 62 | 69 | 390 | 51 | Alta |
| RO-320+00-NE40 | 9/6/2006 | 3.7-4.4 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine sand and loamy fine sand | C2 | SP | 6.8 | <4 | 130 | 59 | 48 | 54 | 300 | 40 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE420 | 9/7/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br silt loam, moist, subangular blocky, moist, friable, slightly plastic, very few very fine roots, sticky when well moistened | A | ML | 24.6 | 16 | 3400 | 1700 | 1900 | 1800 | 8800 | 1300 | Dow |
| RO-320+00-NE420 | 9/7/2006 | 0.2-0.6 | low terrace | 10YR 4/2 dark grayish brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | A/B | SM | 16 | 8 | 14000 | 6300 | 8500 | 6200 | 35000 | 5200 | Dow |
| RO-320+00-NE420 | 9/7/2006 | 0.6-2.4 | low terrace | 10YR 4/3 brown silt loam, moist, subangular blocky, moist, friable, slightly plastic | Bw | SM | 18.5 | <4 | 3400 | 1500 | 1500 | 1300 | 7600 | 1000 | Dow |
| RO-320+00-NE420 | 9/7/2006 | 2.4-4.3 | low terrace | 10YR 4/3 brown sandy clay loam, moist, subangular blocky, moist, friable, moderately plastic, friable to firm | Bt | CL | 16.5 | <4 | 38 | 18 | 17 | 19 | 92 | 15 | Dow |
| RO-320+00-NE420 | 9/7/2006 | 4.3-5.7 | low terrace | 10YR 5/3 brown fine sandy loam, common mottle, moist, subangular blocky, moist, very friable, slightly plastic, common medium faint mottles freshwater shells | C2 | SM | 16.2 | <4 | 25 | 14 | 11 | 13 | 63 | 10 | Dow |
| RO-320+00-NE420 | 9/7/2006 | 5.7-6.6 | low terrace | 10YR 4/3 brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, small piece of buried wood | C3 | SC | 17.5 | 4 | <4 | <4 | <4 | <6 | <22 * | <10 * | Dow |
| RO-320+00-NE500 | 9/7/2006 | 0.0-0.3 | upland | 10YR 2/1 black fine sand, moist, single grain, moist, loose, Non-plastic | A | SP | 19.2 | 8 | 1700 | 830 | 820 | 760 | 4100 | 570 | Dow |
| RO-320+00-NE500 | 9/7/2006 | 0.0-0.3 Field Duplicate | upland | 10YR 2/1 black fine sand, moist, single grain, moist, loose, Non-plastic | A | SP | 17.5 | 6 | 1500 | 730 | 710 | 680 | 3600 | 500 | Dow |
| RO-320+00-NE500 | 9/7/2006 | 0.3-1.2 | upland | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | Bw | SP | 3.4 | 5 | 2200 | 720 | 740 | 560 | 4200 | 580 | Dow |
| RO-320+00-NE500 | 9/7/2006 | 1.2-2.9 | upland | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 3.2 | <4 | 21 | 14 | 11 | 10 | 56 | <10 | Dow |
| RO-320+00-NE500 | 9/7/2006 | 2.9-4.4 | upland | 10YR 6/4 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 3.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RO-320+00-NE500 | 9/7/2006 | 4.4-6.1 | upland | 2.5Y 7/4 pale yellow fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 3.3 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE60 | 9/6/2006 | 0.0-0.4 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, very friable, slightly plastic, common fine roots, Common very fine and fine roots | A | SM | 23 | 32 | 14000 | 6100 | 4800 | 5700 | 31000 | 4000 | Alta |
| RO-320+00-NE60 | 9/6/2006 | 0.4-1.2 | high terrace | 10YR 3/2 very dark grayish br very fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | A/B | SM | 14.1 | 8 | 16000 | 6700 | 5600 | 5400 | 33000 | 4400 | Alta |
| RO-320+00-NE60 | 9/6/2006 | 1.2-3.3 | high terrace | 10YR 3/6 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, Non-plastic, subangular blocky to single grain freshwater shells | Bs | SM | 11.2 | <4 | 800 | 360 | 280 | 280 | 1700 | 230 | Alta |
| RO-320+00-NE60 | 9/6/2006 | 3.3-3.8 | high terrace | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, freshwater shells | C1 | SP | 6.2 | <4 | 120 | 40 | 43 | 26 | 230 | 33 | Dow |
| RO-320+00-NE60 | 9/6/2006 | 3.8-4.4 | high terrace | 10YR 3/4 dark yellowish brown and 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, fine and very fine sand freshwater shells | C2 | SP | 7.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-NE635 | 9/7/2006 | 0.0-0.9 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots | A | SC | 12.8 | 4 | 1700 | 830 | 790 | 770 | 4100 | 570 | Dow |
| RO-320+00-NE635 | 9/7/2006 | 0.9-1.4 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots | A/C | SC | 10.5 | <4 | 140 | 78 | 70 | 67 | 350 | 51 | Dow |
| RO-320+00-NE635 | 9/7/2006 | 1.4-2.2 | high terrace | 10YR 4/2 dark grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 8.2 | <4 | <4 | <4 | <5 | <8 | <25 | <10 | Dow |
| RO-320+00-NE635 | 9/7/2006 | 2.2-3.6 | high terrace | 10YR 4/2 dark grayish brown and 10YR 5/2 grayish brown loamy sand, moist, single grain, moist, loose, Non-plastic, 10YR 4/2 loamy sand 10YR 5/2 sandy loam single grain to subangular blocky non-plastic to slightly plastic loose to friable | C2 | SP-SC | 10.1 | <4 | 54 | 30 | 25 | 28 | 140 | 21 | Dow |
| RO-320+00-NE635 | 9/7/2006 | 3.6-4.4 | high terrace | 10YR 5/2 grayish brown sandy clay, many 7.5YR 5/6 strong brown mottle, moist, massive, moist, firm, moderately plastic, coarse prominent mottles | 2C3 | CL | 24.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-320+00-NE765 | 9/7/2006 | 0.0-1.4 | high terrace | 10YR 3/2 very dark grayish br fine sand, moist, granular, moist, loose, Non-plastic, fine sand and loamy fine sand granular to single grain | A | SP | 10.9 | <4 | 410 | 200 | 200 | 200 | 1000 | 140 | Dow |
| RO-320+00-NE765 | 9/7/2006 | 1.4-1.9 | high terrace | 10YR 3/2 very dark grayish br and 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic | A/E | SP | 7.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-320+00-NE765 | 9/7/2006 | 1.9-2.6 | high terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic | E | SP | 4.9 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RO-320+00-NE765 | 9/7/2006 | 2.6-3.3 | high terrace | 7.5YR 5/8 strong brown sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 9.8 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RO-320+00-NE765 | 9/7/2006 | 3.3-4.4 | high terrace | 10YR 5/1 gray sandy clay loam, moist, subangular blocky, moist, firm, moderately plastic | 2C | CL | 18.5 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-NE85 | 9/6/2006 | 0.0-0.5 | intermediate terrace | 10R 3/4 dusky red very fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 22.5 | 44 | 8400 | 3500 | 2800 | 3800 | 19000 | 2400 | Alta |
| RO-320+00-NE85 | 9/6/2006 | 0.5-1.7 | intermediate terrace | 10YR 4/2 dark grayish brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, few very fine roots | Bw | SM | 17.1 | <4 | 4400 | 1800 | 1400 | 1500 | 9100 | 1200 | Alta |
| RO-320+00-NE85 | 9/6/2006 | 1.7-2.9 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C1 | SM | 14.4 | <4 | 12 | 5 | 4 | 4 | 25* | <10* | Dow |
| RO-320+00-NE85 | 9/6/2006 | 2.9-4.4 | intermediate terrace | 10YR 4/3 brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C2 | SM | 18 | <4 | 49 | 15 | 14 | 11 | 88 | 14 | Alta |
| RO-320+00-NE85 | 10/19/2006 | 4.4-5.5 | intermediate terrace | 10YR 4/3 brown silty clay loam, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, trace white freshwater shells | C3 | ML | 15 | <4 | 9 | 4 | 4 | 5 | 21* | <10* | Alta |
| RO-320+00-NE85 | 10/19/2006 | 5.5-6.6 | intermediate terrace | 10YR 4/3 brown silty clay loam, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, trace white freshwater shells | C3 | ML | 17.9 | <4 | 12 | 6 | 6 | 7 | 30* | <10* | Alta |
| RO-320+00-NE85 | 10/19/2006 | 6.6-7.7 | intermediate terrace | 10YR 4/3 brown silty clay loam, common 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots, trace white freshwater shells | C3 | ML | 19.2 | <4 | 41 | 19 | 15 | 17 | 93 | 14 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-SW10 | 10/10/2006 | 0.0-0.7 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, weak, moist, friable, non-sticky, slightly plastic, few very fine roots | A | SM | 16.9 | 13 | 12000 | 4700 | 5100 | 4300 | 26000 | 3700 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 0.7-2.6 | natural levee | 10YR 4/2 dark grayish brown loam, moist, subangular blocky, weak, moist, friable, non-sticky, slightly plastic, very few medium roots, Charcoal at 2.2' | Bw | SM | 34.9 | 7 | 6900 | 3700 | 3200 | 3300 | 17000 | 2300 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 2.6-3.3 | natural levee | 10YR 4/4 dark yellowish brown sandy clay loam, dry, angular blocky, weak, dry, slightly hard, moderately sticky, moderately plastic | C1 | CL | 11.9 | <4 | 33 | 14 | 13 | 12 | 72 | 12 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 3.3-4.8 | natural levee | 10YR 3/3 dark brown clay loam, moist, angular blocky, moist, very firm, very plastic | C2 | CH | 17.2 | <4 | 42 | 20 | 19 | 16 | 97 | 15 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 4.8-6.0 | natural levee | 10YR 5/2 grayish brown sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, slightly sticky, moderately plastic, Sample has an overall orange color due to the profusion of mottles. Concentrations of organic matter near the top of this horizon. | C3 | CL | 16 | <4 | 27 | 12 | 12 | 10 | 60 | 11 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 6.0-6.9 | natural levee | 10YR 6/2 light brownish gray very fine sandy loam, many 10YR 5/6 yellowish brown mottle, moist, subangular blocky, weak, moist, friable, non-sticky, slightly plastic | C4 | SM | 11.2 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 6.9-8.0 | natural levee | 10YR 5/2 grayish brown sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, weak, moist, firm, non-sticky, moderately plastic | C5 | CL | 17.1 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Dow |
| RO-320+00-SW10 | 10/10/2006 | 8.0-8.3 | natural levee | 10YR 6/2 light brownish gray and 10YR 6/4 light yellowish brow sand, wet, single grain, moist, loose, non-sticky, Non-plastic | 2C6 | SP | 16.8 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RO-320+00-SW10 | 10/10/2006 | 8.3-8.8 | natural levee | 10YR 4/1 dark gray silty clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic, Few small pockets of sand. | 3C7 | CL | 20.6 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-SW120 | 10/18/2006 | 0.0-1.1 | intermediate terrace | 10YR 3/2 very dark grayish br silty clay loam, moist, granular, weak, moist, firm, moderately plastic, very few fine roots | A3 | CL | 29 | 17 | 1700 | 730 | 580 | 700 | 3700 | 500 | Alta |
| RO-320+00-SW120 | 10/18/2006 | 0.0-1.1 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br silty clay loam, moist, granular, weak, moist, firm, moderately plastic, very few fine roots | A3 | CL | 31 | 18 | 1700 | 840 | 680 | 840 | 4100 | 550 | Alta |
| RO-320+00-SW120 | 10/18/2006 | 1.1-2.7 | intermediate terrace | 10YR 4/2 dark grayish brown silty clay loam, common 7.5YR 4/6 strong brown mottle, moist, angular blocky, moist, firm, moderately plastic, very few very fine roots | Cg1 | CL | 27.7 | <4 | 260 | 120 | 95 | 99 | 570 | 77 | Alta |
| RO-320+00-SW120 | 10/18/2006 | 2.7-3.8 | intermediate terrace | 10YR 4/2 dark grayish brown silty clay loam, common 7.5YR 4/6 strong brown mottle, moist, angular blocky, moist, firm, moderately plastic, very few very fine roots | Cg1 | CL | 26.1 | <4 | 7 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RO-320+00-SW120 | 10/18/2006 | 3.8-4.8 | intermediate terrace | 10YR 4/1 dark gray clay loam, few 10YR 3/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic | Cg2 | CH | 27.7 | <4 | 9 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-320+00-SW120 | 10/18/2006 | 4.8-5.5 | intermediate terrace | 10YR 4/1 dark gray clay loam, few 10YR 3/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic | Cg2 | CH | 27 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-320+00-SW210 | 10/18/2006 | 0.0-0.7 | wetland | 10YR 3/1 very dark gray silt loam, moist, granular, moderate, moist, friable, moderately plastic, common very fine roots | A | CL | 40.7 | 34 | 1400 | 680 | 560 | 790 | 3400 | 480 | Alta |
| RO-320+00-SW210 | 10/18/2006 | 0.7-2.5 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 3/6 dark yellowish brown mottle, wet, angular blocky, weak, moist, friable, moderately plastic, very few very fine roots | Cg1 | CL | 34.6 | 7 | 670 | 240 | 200 | 220 | 1300 | 180 | Alta |
| RO-320+00-SW210 | 10/18/2006 | 2.5-4.1 | wetland | 10YR 3/1 very dark gray silty clay, few 10YR 3/6 dark yellowish brown mottle, wet, massive, moist, very firm, very plastic | Cg2 | CH | 34.6 | <4 | 9 | 4 | <4 | 4 | <20 * | <10 * | Alta |
| RO-320+00-SW210 | 10/18/2006 | 4.1-5.5 | wetland | 10YR 3/1 very dark gray and 10YR 5/1 gray silty clay loam, wet, massive, moist, firm, moderately plastic. Alternating layers of lighter and darker sediments. Few shell fragments. Small amounts of buried organic matters. | Cg3 | CL | 48.4 | <4 | 11 | 5 | 5 | 7 | 28* | <10 * | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-SW25 | 10/10/2006 | 0.0-0.5 | high terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moderate, moist, friable, non-sticky, moderately plastic, common fine roots, Very few medium roots. | 3A7 | CL | 25.5 | 11 | 1200 | 550 | 530 | 520 | 2800 | 400 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 0.5-1.7 | high terrace | 10YR 3/3 dark brown clay loam, moist, angular blocky, moderate, moist, firm, slightly sticky, very plastic, very few very fine roots | 3AB7 | CH | 22.9 | 27 | 390 | 190 | 170 | 160 | 930 | 150 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 1.7-2.8 | high terrace | 10YR 3/2 very dark grayish br clay, many 7.5YR 4/6 strong brown mottle, moist, angular blocky, moderate, moist, very firm, slightly sticky, very plastic | 3Bt1 | CH | 24.5 | <4 | 50 | 24 | 22 | 20 | 120 | 18 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 2.8-3.4 | high terrace | 7.5YR 4/1 dark gray clay loam, many 7.5YR 4/4 brown and 7.5YR 4/6 strong brown mottle, moist, angular blocky, moderate, moist, very firm, slightly sticky, very plastic | 3Bt2 | CH | 22 | <4 | 34 | 21 | 17 | 18 | 90 | 14 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 3.4-4.6 | high terrace | 10YR 5/2 grayish brown sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, non-sticky, moderately plastic | 3C1 | CL | 15.3 | <4 | <4 | <4 | <7 ^{LISR} | <4 | <23 | <10 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 4.6-5.6 | high terrace | 10YR 5/1 gray sandy clay loam, common 10YR 4/6 dark yellowish brown and 10YR 5/6 yellowish brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals :4.6-5.6 ft and 5.6-6.6 ft. Some areas are siltier. Irregular black staining from organic matter. | C2 | CL | 17.7 | <4 | <4 | <4 | <4 | <9 ^{LISR} | <25 | <10 | Dow |
| RO-320+00-SW25 | 10/10/2006 | 5.6-6.6 | high terrace | 10YR 5/1 gray sandy clay loam, common 10YR 4/6 dark yellowish brown and 10YR 5/6 yellowish brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals :4.6-5.6 ft and 5.6-6.6 ft. Some areas are siltier. Irregular black staining from organic matter. | C2 | CL | 18.5 | <4 | 4 | <4 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RO-320+00-SW275 | 10/18/2006 | 0.0-0.5 | wetland | 10YR 3/1 very dark gray silt loam, moist, granular, weak, moist, friable, slightly plastic, very few very fine roots | A | ML | 58.8 | 20 | 1000 | 490 | 400 | 600 | 2500 | 350 | Alta |
| RO-320+00-SW275 | 10/18/2006 | 0.5-2.2 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 4/4 dark yellowish brown mottle, wet, angular blocky, weak, moist, firm, moderately plastic, Darker areas evidence of organic matter accumulation. | C1 | CL | 34.9 | <4 | 3700 | 1200 | 940 | 740 | 6600 | 850 | Alta |
| RO-320+00-SW275 | 10/18/2006 | 2.2-3.1 | wetland | 10YR 4/1 dark gray silty clay loam, few 10YR 4/4 dark yellowish brown mottle, wet, angular blocky, weak, moist, firm, moderately plastic, Darker areas evidence of organic matter accumulation. | C1 | CL | 44.9 | <4 | 320 | 130 | 110 | 110 | 670 | 89 | Alta |
| RO-320+00-SW275 | 10/18/2006 | 3.1-4.4 | wetland | 5Y 4/1 dark gray and 5Y 3/1 very dark gray silt loam, wet, platy, moist, friable, slightly plastic, Many white shell fragments. Irregular thin layers of 5Y 6/3 silt loam; may be marl. | Cg2 | ML | 53.1 | <4 | 720 | 330 | 290 | 390 | 1700 | 230 | Alta |
| RO-320+00-SW275 | 10/18/2006 | 4.4-5.5 | wetland | 5Y 4/1 dark gray and 5Y 3/1 very dark gray silt loam, wet, platy, moist, friable, slightly plastic, Many white shell fragments. Irregular thin layers of 5Y 6/3 silt loam; may be marl. | Cg2 | ML | 53 | <4 | 110 | 58 | 43 | 57 | 260 | 35 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-SW45 | 10/10/2006 | 0.0-0.9 | intermediate terrace | 10YR 3/2 very dark grayish br silty clay loam, moist, subangular blocky, moderate, moist, firm, slightly sticky, moderately plastic, few very fine roots | 3A2 | CL | 9.8 | 9 | 590 | 280 | 270 | 280 | 1400 | 200 | Dow |
| RO-320+00-SW45 | 10/10/2006 | 0.9-2.0 | intermediate terrace | 10YR 4/2 dark grayish brown and 10YR 3/2 very dark grayish br clay loam, few 10YR 4/4 dark yellowish brown mottle, moist, angular blocky, weak, moist, very firm, slightly sticky, very plastic | 3Bw2 | CH | 23 | <4 | 540 | 290 | 270 | 280 | 1400 | 190 | Dow |
| RO-320+00-SW45 | 10/10/2006 | 2.0-3.3 | intermediate terrace | 10YR 4/1 dark gray and 10YR 3/1 very dark gray silty clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals: 2.0'-3.3', 3.3'-4.8'. Irregular concentrations of organic matter. | 3C1 | CL | 19.7 | <4 | 19 | 10 | 9 | 10 | 47* | <10 * | Dow |
| RO-320+00-SW45 | 10/10/2006 | 3.3-4.8 | intermediate terrace | 10YR 4/1 dark gray and 10YR 3/1 very dark gray silty clay loam, common 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals: 2.0'-3.3', 3.3'-4.8'. Irregular concentrations of organic matter. | 3C1 | CL | 21.6 | <4 | 39 | 21 | 19 | 21 | 100 | 16 | Dow |
| RO-320+00-SW45 | 10/10/2006 | 4.8-5.5 | intermediate terrace | 5Y 4/1 dark gray silty clay loam, few 2.5Y 4/4 olive brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic | 3C2 | CL | 29 | <4 | <4 | <4 | <4 | <8 ^{LISR} | <24 | <10 | Dow |
| RO-320+00-SW450 | 10/18/2006 | 0.0-0.6 | low terrace | 10YR 3/1 very dark gray silt loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A2 | ML | 34.1 | 13 | 120 | 58 | 52 | 83 | 320 | 55 | Alta |
| RO-320+00-SW450 | 10/18/2006 | 0.0-0.6 Field Duplicate | low terrace | 10YR 3/1 very dark gray silt loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A2 | ML | 33.4 | 10 | 130 | 64 | 58 | 83 | 350 | 56 | Alta |
| RO-320+00-SW450 | 10/18/2006 | 0.6-2.2 | low terrace | 2.5Y 4/1 dark gray silty clay loam, few 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, weak, moist, firm, moderately plastic, few very fine roots | Bw | CL | 24.1 | 5 | 240 | 120 | 88 | 87 | 540 | 75 | Alta |
| RO-320+00-SW450 | 10/18/2006 | 2.2-3.4 | low terrace | 10YR 4/1 dark gray clay loam, few 10YR 4/4 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, moderately plastic | C1 | CL | 22.1 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-320+00-SW450 | 10/18/2006 | 3.4-4.1 | low terrace | 10YR 5/1 gray silty clay loam, common 10YR 5/4 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | Cg2 | CL | 22.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-320+00-SW450 | 10/18/2006 | 4.1-5.5 | low terrace | 10YR 5/1 gray silty clay loam, common 10YR 5/4 yellowish brown mottle, wet, massive, moist, firm, moderately plastic | Cg2 | CL | 22 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-320+00-SW80 | 10/10/2006 | 0.0-0.6 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moderate, moist, friable, slightly sticky, slightly plastic, many very fine roots | 3A2 | ML | 38.6 | 18 | 360 | 190 | 180 | 260 | 1000 | 150 | Dow |
| RO-320+00-SW80 | 10/10/2006 | 0.6-2.2 | low terrace | 10YR 4/1 dark gray silty clay loam, many 10YR 3/6 dark yellowish brown mottle, moist, angular blocky, weak, moist, firm, moderately sticky, moderately plastic, Wet below 1.7'. Texture grading to clay loam. | 3C1 | CL | 26.2 | 5 | 370 | 170 | 170 | 160 | 880 | 130 | Dow |
| RO-320+00-SW80 | 10/10/2006 | 2.2-3.3 | low terrace | 10YR 4/1 dark gray clay loam, common 10YR 3/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals: 2.2'-3.3', 3.3'-4.4'. Some areas darker due to organic material. | 3C2 | CL | 24.4 | <4 | 11 | 6 | 5 | 6 | 27* | <10 * | Dow |
| RO-320+00-SW80 | 10/10/2006 | 3.3-4.4 | low terrace | 10YR 4/1 dark gray clay loam, common 10YR 3/6 dark yellowish brown and 7.5YR 4/6 strong brown mottle, wet, massive, moist, firm, slightly sticky, moderately plastic, Sample intervals: 2.2'-3.3', 3.3'-4.4'. Some areas darker due to organic material. | 3C2 | CL | 25.6 | <4 | 22 | 8 | 6 | 4 | 39* | <10 * | Dow |
| RO-320+05-NE40 | 11/7/2006 | 4.4-6.4 | historic natural levee | 7.5YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots, very fine sand layer at 6.6' and 8.2' | 2C | SM | 11.6 | <4 | 33 | 15 | 14 | 11 | 73 | 12 | Dow |
| RO-320+05-NE40 | 11/7/2006 | 4.4-6.4 Field Duplicate | historic natural levee | 7.5YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots, very fine sand layer at 6.6' and 8.2' | 2C | SM | 10.8 | <4 | 26 | 11 | 9 | 7 | 54 | <10 * | Dow |
| RO-320+05-NE40 | 11/7/2006 | 6.4-8.3 | historic natural levee | 7.5YR 4/3 brown very fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic, very few very fine roots, very fine sand layer at 6.6' and 8.2' | 2C | SM | 8.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-320+05-NE40 | 11/7/2006 | 8.3-9.2 | historic natural levee | 7.5YR 4/3 brown very fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots, very few coarse sand, very few shell fragments | 3C | SM | 16.6 | <4 | <4 | <5 | <5 | <9 | <27 | <10 | Dow |
| RO-320+05-NE40 | 11/7/2006 | 9.2-10.0 | historic natural levee | 7.5YR 4/3 brown very fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots, very few coarse sand, very few shell fragments | 3C | SM | 19.1 | <4 | 19 | 9 | 8 | 7 | 43* | <10 * | Dow |
| RO-321+50-IC-SW75 | 12/6/2006 | 0.0-0.9 | in-channel | 2.5Y 4/3 olive brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, coarse gravel near top of core, fine and medium below, few shell fragments | 1 | SW | 15.4 | <4 | 20 | 4 | 5 | 7 | 37* | <10 * | Dow |
| RO-321+50-IC-SW75 | 12/6/2006 | 0.0-0.9 Lab Duplicate | in-channel | 2.5Y 4/3 olive brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, coarse gravel near top of core, fine and medium below, few shell fragments | 1 | SW | 16 | <4 | 23 | 5 | 6 | 5 | 38* | <10 * | Dow |
| RO-321+50-IC-SW75 | 12/6/2006 | 0.9-1.5 | in-channel | 10YR 2/1 black , wet, All wood | 2 | -- | 67.6 | <8 ^{LSV} | <14 ^{LSV} | <20 ^{LSV} | <21 ^{LSV} | <42 ^{LSV} | <100 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-321+50-NE450 | 11/5/2006 | 0.0-1.0 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, moderately plastic, few very fine roots | A2 | ML/CL | 29.1 | 31 | 4900 | 2400 | 2000 | 2400 | 12000 | 1600 | Alta |
| RO-321+50-NE450 | 11/5/2006 | 1.0-2.2 | low terrace | 10YR 3/2 very dark grayish br fine sandy loam, common 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Horizon divided for sample analysis. | C1 | SM | 17.4 | <4 | 1200 | 550 | 440 | 440 | 2700 | 350 | Alta |
| RO-321+50-NE450 | 11/5/2006 | 2.2-3.3 | low terrace | 10YR 3/2 very dark grayish br fine sandy loam, common 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Horizon divided for sample analysis. | C1 | SM | 14.9 | <4 | 600 | 260 | 230 | 220 | 1300 | 180 | Alta |
| RO-321+50-NE450 | 11/5/2006 | 3.3-4.9 | low terrace | 10YR 3/2 very dark grayish br fine sandy loam, common 10YR 3/4 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, Horizon divided for sample analysis. | C1 | SM | 14.8 | <4 | 74 | 32 | 27 | 28 | 160 | 23 | Alta |
| RO-321+50-NE450 | 11/5/2006 | 4.9-6.6 | low terrace | 10YR 4/2 dark grayish brown and 7.5YR 5/3 brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, <15% gravel, moist, subangular blocky, moist, firm, moderately plastic, Few subrounded and subangular gravel. Layer of 7.5YR 5/3 sandy clay at 5.6'. 2.5Y 6/8 brownish yellow coloration (single spot) at 6.5'. Unknown origin, but likely natural. | C2 | CL | 12.6 | <4 | 23 | 10 | 8 | 12 | 52 | <10 * | Alta |
| RO-321+50-NE50 | 11/5/2006 | 0.0-0.3 | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | SM | 27.1 | 35 | 34000 | 13000 | 11000 | 12000 | 69000 | 9000 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 0.0-0.3 Field Duplicate | high terrace | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | SM | 27.2 | 36 | 32000 | 13000 | 11000 | 11000 | 67000 | 8700 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 0.3-1.1 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 9 | 17 | 59000 | 24000 | 20000 | 19000 | 120000 | 16000 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 1.1-2.2 | high terrace | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, weak, moist, friable, slightly plastic, Grades to fine sandy loam going deeper, but color does not change. Horizon divided for sample analysis. | C2 | SP-SM | 12.3 | <4 | 3500 | 1800 | 1200 | 2000 | 8500 | 1100 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 2.2-3.3 | high terrace | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, weak, moist, friable, slightly plastic, Grades to fine sandy loam going deeper, but color does not change. Horizon divided for sample analysis. | C2 | SP-SM | 12.2 | <4 | 240 | 98 | 70 | 76 | 480 | 63 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 3.3-4.4 | high terrace | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, weak, moist, friable, slightly plastic, Grades to fine sandy loam going deeper, but color does not change. Horizon divided for sample analysis. | C2 | SP-SM | 14.8 | <4 | 480 | 190 | 160 | 160 | 1000 | 130 | Alta |
| RO-321+50-NE50 | 11/5/2006 | 4.4-5.5 | high terrace | 10YR 3/4 dark yellowish brown loamy fine sand, moist, subangular blocky, weak, moist, friable, slightly plastic, Grades to fine sandy loam going deeper, but color does not change. Horizon divided for sample analysis. Freshwater shell at 5.5'. | C2 | SP-SM | 15.8 | <4 | 620 | 210 | 190 | 160 | 1200 | 160 | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-322+00-IC-SW75 | 12/6/2006 | 0.0-0.2 | in-channel | 2.5Y 4/3 olive brown coarse sand, 35-60% gravel, wet, single grain, moist, loose, Non-plastic, some coarse sand as matrix, mostly coarse subrounded gravel | 1 | SW | 12.9 | <4 | 33 | 8 | 8 | 7 | 56 | <10 [*] | Dow |
| RO-322+00-IC-SW75 | 12/6/2006 | 0.2-0.9 | in-channel | 2.5Y 4/3 olive brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, many shell fragments, fine subrounded gravel, few coarse sand grains | 2 | SW | 15.8 | <4 | 36 | 9 | 12 | 22 | 78 | 13 | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 0.0-0.8 | tributary | 2.5Y 4/1 dark gray and 2.5Y 3/1 very dark gray sandy loam, few 10YR 4/6 dark yellowish brown and 2.5Y 5/6 light olive brown mottle, moist, subangular blocky, weak, moist, friable, non-sticky, slightly plastic, very few very fine roots, Very fine sandy loam. Thin layer of recently deposited very fine sand at surface. | 1 | SM | 25.3 | 19 | 3300 | 1500 | 1400 | 1600 | 7800 | 1100 | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 0.8-1.7 | tributary | 2.5Y 4/2 dark grayish brown and 2.5Y 4/1 dark gray sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, wet, angular blocky, weak, moist, friable, non-sticky, moderately plastic, Intermittent layers of sandy material. | 2 | ML/CL | 29.9 | 10 | 1200 | 480 | 500 | 450 | 2600 | 370 | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 1.7-2.1 | tributary | 2.5Y 2/1 black sandy clay loam, wet, angular blocky, weak, moist, firm, non-sticky, moderately plastic, Enriched organic matter. | 3 | ML/CL | 38.2 | <4 | 4 | <4 | 18 | <12 | <28 [*] | <10 [*] | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 2.1-3.3 | tributary | 2.5Y 4/1 dark gray silt loam, few 7.5YR 4/6 strong brown mottle, wet, angular blocky, weak, moist, friable, non-sticky, slightly plastic, Few very small shells. Small areas of concentrated organic materials. | 4 | ML | 46 | <4 | 120 | 56 | 54 | 59 | 290 | 42 | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 3.3-4.4 | tributary | 2.5Y 4/1 dark gray silty clay loam, wet, massive, moist, firm, non-sticky, moderately plastic, Sample intervals 3.3'-4.4' and 4.4'-5.5'. Few small and medium shells. Irregular areas of concentrated organic matter (2.5Y 2.5/1). | 5 | ML/CL | 36.7 | <4 | 7 | 4 | 4 | 5 | <20 [*] | <10 [*] | Dow |
| RO-322+00-T-SW205 | 10/9/2006 | 4.4-5.5 | tributary | 2.5Y 4/1 dark gray silty clay loam, wet, massive, moist, firm, non-sticky, moderately plastic, Sample intervals 3.3'-4.4' and 4.4'-5.5'. Few small and medium shells. Irregular areas of concentrated organic matter (2.5Y 2.5/1). | 5 | ML/CL | 32.9 | <4 | 8 | 4 | 4 | 5 | 21 [*] | <10 [*] | Dow |
| RO-322+00-T-SW80 | 10/9/2006 | 0.0-0.8 | tributary | 10YR 4/2 dark grayish brown very fine sandy loam, moist, structureless, moist, very friable, non-sticky, slightly plastic | 1 | SM | 35.8 | <4 | 490 | 160 | 290 | 130 | 1100 | 170 | Dow |
| RO-322+00-T-SW80 | 10/9/2006 | 0.8-2.2 | tributary | 10YR 4/1 dark gray silt loam, many 10YR 4/6 dark yellowish brown mottle, wet, angular blocky, weak, moist, friable, slightly sticky, slightly plastic, Same decaying wood material. Some small shells. | 2 | ML | 28.2 | <4 | 9 | 5 | 5 | 7 | 25 [*] | <10 [*] | Dow |
| RO-322+00-T-SW80 | 10/9/2006 | 2.2-3.3 | tributary | N 4/0 dark gray silty clay loam, few 10YR 4/6 dark yellowish brown mottle, wet, massive, moist, firm, moderately sticky, moderately plastic, Some organic matter. Some small shells. | 3 | ML/CL | 24.5 | <4 | <4 | <6 | <5 | <10 | <29 | <10 | Dow |
| RO-322+00-T-SW80 | 10/9/2006 | 3.3-4.4 | tributary | 10Y 4/1 dark greenish gray silty clay loam, <15% gravel, wet, massive, moist, firm, moderately sticky, moderately plastic, Grading toward silty clay. | 4 | ML/CL | 23.7 | <4 | <5 ^{LISR} | <5 | <5 | <10 | <29 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-322+50-IC-C | 10/16/2006 | 0.0-0.5 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, very few angular glossy black coarse sand, few fine gravel, very few shell fragments, subrounded and subangular grains | 1 | SM | 8.1 | <4 | 830 | 380 | 310 | 260 | 1800 | 240 | Alta |
| RO-322+50-IC-C | 10/16/2006 | 0.5-1.1 Lab Duplicate | in-channel | 10YR 2/1 black , moist, Non-plastic, many medium roots, wood/black material | 2 | -- | 44.2 | 15 | 100000 | 33000 | 30000 | 18000 | 180000 | 24000 | Alta |
| RO-322+50-IC-C | 10/16/2006 | 0.5-1.1 Lab Duplicate | in-channel | 10YR 2/1 black , moist, Non-plastic, many medium roots, wood/black material | 2 | -- | 44.2 | 74 | 380000 | 140000 | 140000 | 83000 | 740000 | 100000 | Alta |
| RO-322+50-IC-C | 10/16/2006 | 0.5-1.1 | in-channel | 10YR 2/1 black , moist, Non-plastic, many medium roots, wood/black material | 2 | -- | 44.2 | 44 | 280000 | 160000 | 130000 | 100000 | 660000 | 87000 | Alta |
| RO-322+50-IC-C | 10/16/2006 | 1.1-1.3 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few medium roots, few shell fragments, very few fine gravel, very few angular glossy black coarse sand, subrounded grains | 3 | SM | 36.5 | <4 | 570 | 130 | 130 | 59 | 890 | 120 | Alta |
| RO-322+50-IC-NE | 10/11/2006 | 0.0-0.2 | in-channel | 10YR 4/3 brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few shell fragments, very few angular glossy black coarse sand, subrounded grains | 1 | SM | 14.5 | <4 | 28 | 11 | 10 | 14 | 63 | 10 | Alta |
| RO-322+50-IC-NE | 10/11/2006 | 0.2-0.7 | in-channel | 10YR 4/2 dark grayish brown sand, moist, single grain, moist, loose, Non-plastic, few fine gravel, few shell fragments, very few angular glossy black coarse sand, subrounded and subangular grains | 2 | SM | 10.2 | <4 | 73 | 17 | 17 | 16 | 120 | 18 | Alta |
| RO-322+50-IC-NE | 10/11/2006 | 0.7-1.6 | in-channel | 10YR 4/1 dark gray sand, moist, single grain, moist, loose, Non-plastic, few fine roots, common fine gravel, few angular glossy black coarse sand, few shell fragments, subrounded and subangular grains | 3 | SM | 15.8 | <4 | 20 | 5 | 5 | 7 | 37* | <10 * | Alta |
| RO-322+50-IC-SW | 10/16/2006 | 0.0-0.8 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, common coarse sand, few fine gravel, very few shell fragments, very few angular glossy black coarse sand, subrounded grains | 1 | SM | 10.7 | <4 | 28 | 6 | 6 | 8 | 48* | <10 * | Alta |
| RO-322+50-IC-SW | 10/16/2006 | 0.8-1.0 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few fine gravel, very few shell fragments, subrounded and subangular grains | 2 | SM | 26.6 | <4 | 41 | 8 | 8 | 7 | 64 | 10 | Alta |
| RO-322+50-IC-SW | 10/16/2006 | 1.0-1.2 | in-channel | 10YR 4/1 dark gray silt loam, moist, granular, moist, friable, slightly plastic, common medium roots | 3 | ML | 45 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-322+50-IC-SW | 10/16/2006 | 1.2-1.5 | in-channel | 10YR 4/1 dark gray sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few medium roots, few coarse sand, very few fine gravel, few shell fragments, few angular glossy black coarse sand, subrounded grains | 4 | SM | 15.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

All concentrations are expressed on a dry weight basis.

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-322+50-IC-SW100 | 12/6/2006 | 0.0-0.3 | in-channel | 2.5Y 4/2 dark grayish brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, common shell fragments, few coarse sand, fine and medium subrounded gravel | 1 | SW | 14 | <23 ^{MI} | 36 | <26 ^{MI} | <37 ^{MI} | 16 | 52 | <18 | Dow |
| RO-322+50-IC-SW100 | 12/6/2006 | 0.3-0.8 | in-channel | 2.5Y 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, very few shell fragments, few wood fragments at very bottom of core, common coarse sand, fine and medium subrounded gravel | 2 | SW | 10.2 | <4 | 230 | 42 | 68 | 46 | 390 | 57 | Dow |
| RO-322+50-IC-SW125 | 12/6/2006 | 0.0-0.6 | in-channel | 2.5Y 4/2 dark grayish brown coarse sand, 35<60% gravel, wet, single grain, moist, loose, Non-plastic, Few small wood fragments throughout, few shells, subrounded fine, medium and coarse gravel | 1 | SW | 11 | <4 | 33 | 12 | 13 | 24 | 83 | 30 | Dow |
| RO-322+50-IC-SW25 | 12/6/2006 | 0.0-0.2 | in-channel | 2.5Y 3/2 very dark grayish br and 2.5Y 3/3 dark olive brown loamy fine sand, 15<35% gravel, wet, structureless, moist, very friable, slightly plastic, coarse gravel throughout layer, fine gravel near boundary with next layer | 1 | SM | 21.2 | <4 | 88 | 38 | 44 | 49 | 220 | 33 | Dow |
| RO-322+50-IC-SW25 | 12/6/2006 | 0.2-0.5 | in-channel | 2.5Y 4/1 dark gray silty clay loam, wet, massive, moist, very firm, very plastic | 2 | CL | 28.5 | <4 | 23 | <8 | 6 | 4 | 34* | <10 [*] | Dow |
| RO-322+50-IC-SW50 | 12/6/2006 | 0.0-0.3 | in-channel | 2.5Y 4/2 dark grayish brown fine sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, fine sand matrix with some coarse sand and fine and medium subrounded and subangular gravel | 1 | SW | 7.8 | <4 | 17 | 4 | <5 | 4 | 25* | <10 [*] | Dow |
| RO-322+50-IC-SW50 | 12/6/2006 | 0.3-0.8 | in-channel | 2.5Y 4/1 dark gray clay, wet, massive, moist, extremely firm, very plastic, luustrine clay | 2 | CH | 22.7 | <4 | <4 | <4 | <5 | <8 | <25 | <10 | Dow |
| RO-322+50-IC-SW75 | 12/6/2006 | 0.0-0.6 | in-channel | 10YR 4/2 dark grayish brown sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, few coarse sand, subrounded fine, medium and coarse gravel | 1 | SW | 11.6 | <4 | 18 | <4 | 4 | 6 | 28* | <10 [*] | Dow |
| RO-322+50-IC-SW75 | 12/6/2006 | 0.6-1.4 | in-channel | 10YR 4/1 dark gray sand, 15<35% gravel, wet, single grain, moist, loose, Non-plastic, few coarse sand, very few shell fragments, fine and medium gravel | 2 | SW | 11.9 | <4 | 24 | 5 | 7 | 11 | 47* | <10 [*] | Dow |
| RO-323+00-IC-SW75 | 12/6/2006 | 0.0-0.6 | in-channel | 2.5Y 4/3 olive brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, few medium and coarse rounded and subrounded gravel | 1 | SW | 15.6 | <4 | 47 | 7 | 10 | 11 | 75 | 12 | Dow |
| RO-323+00-IC-SW75 | 12/6/2006 | 0.6-0.9 | in-channel | 2.5Y 2/1 black , wet, structureless, Almost entirely decomposing wood fragments, few shell fragments, few medium and coarse sand grains | 2 | -- | 34.5 | 13 | 11000 | 6900 | 6000 | 4900 | 29000 | 4000 | Dow |
| RO-323+00-IC-SW75 | 12/6/2006 | 0.9-1.0 | in-channel | 2.5Y 4/2 dark grayish brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, Large muscle shells | 3 | SW | 17.6 | <4 | 500 | 180 | 190 | 120 | 990 | 140 | Dow |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|------------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-323+00-NE40 | 11/7/2006 | 0.0-0.7 | historic natural levee | 10YR 2/1 black fine sandy loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | SM | 20.5 | 18 | 7700 | 3000 | 3000 | 3000 | 17000 | 2300 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 0.7-2.7 | historic natural levee | 10YR 5/4 yellowish brown and 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots | C1 | SP | 5.5 | 68 | 65000 | 17000 | 24000 | 15000 | 120000 | 17000 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 2.7-5.6 | historic natural levee | 10YR 3/3 dark brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few fine roots, layer of 10YR 5/4 fine sand from 4.2-4.6' | C2 | SP-SM | 9.5 | <4 | 840 | 320 | 310 | 220 | 1700 | 230 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 2.7-5.6 Field Duplicate | historic natural levee | 10YR 3/3 dark brown loamy fine sand, moist, subangular blocky, weak, moist, very friable, Non-plastic, very few fine roots, layer of 10YR 5/4 fine sand from 4.2-4.6' | C2 | SP-SM | 9.4 | <4 | 1400 | 780 | 590 | 600 | 3300 | 440 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 5.6-6.7 Lab Duplicate | historic natural levee | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few medium roots, few freshwater shells, few areas loamy fine sand | C3 | CL | 9.7 | <4 | 62 | 22 | 20 | 13 | 120 | 18 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 5.6-6.7 | historic natural levee | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few medium roots, few freshwater shells, few areas loamy fine sand | C3 | CL | 9.5 | <6 LISR | 49 | 23 | 21 | 15 | 110 | 18 | Dow |
| RO-323+00-NE40 | 11/7/2006 | 6.7-7.8 | historic natural levee | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few medium roots, few freshwater shells, few areas loamy fine sand | C3 | CL | 8.5 | <4 | 6 | <4 | 4 | 11 | 21* | <10* | Alta |
| RO-323+00-NE40 | 11/7/2006 | 7.8-8.9 | historic natural levee | 10YR 3/4 dark yellowish brown sandy clay loam, moist, subangular blocky, weak, moist, friable, moderately plastic, few medium roots, few freshwater shells, few areas loamy fine sand | C3 | CL | 11.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 0.0-1.0 | natural levee | 10YR 2/2 very dark brown very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, few very fine roots | A | SM | 14.3 | 21 | 18000 | 5900 | 5200 | 5000 | 34000 | 4400 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 1.0-1.6 | natural levee | 10YR 4/3 brown loamy very fine sand, dry, granular, dry, slightly hard, slightly plastic, very few very fine roots | Bw | SM | 11.5 | <4 | 9700 | 4900 | 3700 | 4400 | 23000 | 2900 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 1.6-3.1 | natural levee | 10YR 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, very few fine roots | Bw2 | SM | 16.3 | <4 | 970 | 310 | 250 | 240 | 1800 | 230 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 3.1-4.2 | natural levee | 10YR 4/3 brown loamy very fine sand, dry, granular, dry, slightly hard, slightly plastic, very few fine roots | C | SM | 8.3 | <4 | 220 | 87 | 69 | 74 | 450 | 60 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 4.2-5.0 | natural levee | 10YR 4/2 dark grayish brown silty clay, dry, subangular blocky, dry, hard, moderately plastic | 2C | CL | 12.6 | <4 | 67 | 25 | 21 | 23 | 140 | 20 | Alta |
| RO-323+00-SW10 | 11/6/2006 | 5.0-6.6 | natural levee | 10YR 3/1 very dark gray clay loam, common 7.5YR 4/4 brown mottle, dry, angular blocky, dry, very hard, very plastic | 3C | CL | 15.5 | <4 | 22 | 9 | 7 | 8 | 47* | <10* | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-323+50-IC-SW75 | 12/6/2006 | 0.0-0.3 | in-channel | 2.5Y 4/3 olive brown sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine subrounded gravel, few shell fragments | 1 | SW | 12.7 | <4 | 18 | 5 | 5 | 11 | 39* | <10* | Dow |
| RO-323+50-IC-SW75 | 12/6/2006 | 0.3-0.5 | in-channel | 2.5Y 4/1 dark gray sand, <15% gravel, wet, single grain, moist, loose, Non-plastic, fine subrounded gravel, few shell fragments | 2 | SW | 14 | <4 | 27 | 10 | 8 | 20 | 65 | 11 | Dow |
| RO-323+50-IC-SW75 | 12/6/2006 | 0.5-1.3 | in-channel | 10YR 2/1 black, wet, horizon almost entirely wood, 1.1-1.2' layer of sand (2.5Y 4/1), 0.8-0.9' silty material mixed in with wood, few shell fragments | 3 | -- | 33.8 | <4 | <5 | <4 | <6 | <9 | <28 | <10 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 0.0-0.3 | natural levee | 10YR 3/1 very dark gray fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots | A | SP | 6.4 | 29 | 11000 | 5500 | 9200 | 4100 | 29000 | 4900 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 0.3-0.8 | natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | A/C | SP | 4.3 | | 11000 | 5700 | 6300 | 4700 | 27000 | 3900 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 0.8-2.5 | natural levee | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 6.2 | <4 | 590 | 260 | 270 | 210 | 1300 | 190 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 2.5-3.0 | natural levee | 10YR 4/2 dark grayish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 3.8 | <4 | 57 | 12 | 17 | 9 | 95 | 15 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 3.0-3.7 | natural levee | 10YR 4/3 brown very fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 3.5 | <4 | 1000 | 550 | 520 | 510 | 2600 | 360 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 3.7-4.3 | natural levee | 10YR 3/3 dark brown very fine sand, moist, single grain, moist, loose, Non-plastic | C4 | SP | 5.9 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Dow |
| RO-325+50-NE10 | 9/8/2006 | 4.3-5.8 | natural levee | 10YR 4/3 brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, LAYER OF 10YR 5/4 FINE SAND FROM 5.3-5.4 | C5 | SP | 5.2 | <4 | 49 | 23 | 23 | 20 | 110 | 18 | Dow |
| RO-325+50-NE10 | 9/8/2006 | 5.8-6.7 | natural levee | 10YR 3/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, slightly plastic, LAYER OF 10YR 5/4 LOOSE FINE SAND AT 6.2'-6.3' & 6.6'-6.7' | C6 | SC | 4.6 | <4 | 360 | 150 | 140 | 160 | 800 | 110 | Alta |
| RO-325+50-NE10 | 9/8/2006 | 6.7-7.6 | natural levee | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, friable, slightly plastic, LAYER OF 10YR 5/4 FINE SAND FROM 7.3-7.4 FRESHWATER SNAIL SHELLS | C7 | SC | 8.3 | <4 | 4 | <4 | <4 | <4 | <20* | <10* | Alta |
| RO-325+50-NE10 | 9/8/2006 | 7.6-8.7 | natural levee | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, slightly plastic, LAYERS OF 10YR 5/4 FINE SAND @ 7.8-7.9, 8.3-8.4, 8.5-8.6 | C8 | SC | 7.9 | <4 | 41 | 16 | 16 | 20 | 92 | 14 | Alta |

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|---|-----------------|--------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE1100 | 11/5/2006 | 0.0-1.0 | high terrace | 10YR 3/2 very dark grayish br fine sand, moist, granular, moist, loose, Non-plastic, few very fine roots | A | SP | 13.9 | 4 | 160 | 77 | 64 | 83 | 390 | 55 | Alta |
| RO-325+50-NE1100 | 11/5/2006 | 1.0-2.2 | high terrace | 10YR 4/4 dark yellowish brown and 10YR 3/2 very dark grayish br fine sand, common 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, very friable, Non-plastic, common coarse 5YR 4/6 yellowish red concretions, Ortstein concretions throughout horizon. 10YR 3/2 fine sand is mixed in from plowing. | Bs | SP | 15.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE1100 | 11/5/2006 | 2.2-3.3 | high terrace | 10YR 5/6 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, No ortstein. | C | SW | 15.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE1340 | 9/10/2006 | 0.0-0.7 | high terrace | 10YR 3/2 very dark grayish br fine sand, dry, granular, dry, soft, Non-plastic, common very fine roots | A | SP | 4.8 | <4 | 78 | 44 | 42 | 46 | 210 | 31 | Alta |
| RO-325+50-NE1340 | 9/10/2006 | 0.7-1.3 | high terrace | 10YR 3/3 dark brown fine sand, dry, single grain, dry, loose, Non-plastic, few very fine roots | A/B | SP | 5.9 | <4 | 38 | 25 | 17 | 27 | 110 | 15 | Alta |
| RO-325+50-NE1340 | 9/10/2006 | 1.3-1.9 | high terrace | 10YR 4/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | Bs | SP | 5.9 | <4 | 4 | <4 | <5 ^{LISR} | <9 ^{LISR} | <26 [*] | <10 [*] | Dow |
| RO-325+50-NE1340 | 9/10/2006 | 1.3-1.9 Lab Duplicate | high terrace | 10YR 4/6 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | Bs | SP | 5.4 | <4 | 8 | 5 | <4 | <4 | <20 [*] | <10 [*] | Dow |
| RO-325+50-NE1340 | 9/10/2006 | 1.9-2.4 | high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | B/C | SP | 2.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE1340 | 9/10/2006 | 2.4-3.6 | high terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 3.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE1340 | 9/10/2006 | 3.6-5.0 | high terrace | 10YR 6/3 pale brown fine sand, moist, single grain, moist, loose, Non-plastic, MOIST ABOVE AND WET BELOW | C2 | SP | 12 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE1730 | 9/10/2006 | 0.0-0.2 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | CL | 27.9 | 16 | 360 | 200 | 190 | 320 | 1100 | 160 | Dow |
| RO-325+50-NE1730 | 9/10/2006 | 0.2-0.5 | low terrace | 10YR 4/1 dark gray loam, moist, subangular blocky, moist, friable, moderately plastic, few fine roots, SUBANGULAR BLOCKY TO GRANULAR LOAM TO CLAY LOAM | A/C | CL | 20.4 | 37 | 360 | 180 | 210 | 270 | 1000 | 180 | Dow |
| RO-325+50-NE1730 | 9/10/2006 | 0.5-2.2 | low terrace | 10YR 4/2 dark grayish brown clay loam, common 7.5YR 4/6 strong brown mottle, moist, subangular blocky, moist, very firm, very plastic, COMMON MEDIUM PROMINATE MOTTLES | C1 | CL | 17.7 | <4 | 6 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-325+50-NE1730 | 9/10/2006 | 2.2-3.6 | low terrace | 10YR 5/4 yellowish brown sand, few 7.5YR 5/8 strong brown mottle, moist, single grain, moist, loose, Non-plastic, FEW MEDIUM DISTINCT MOTTLES SANDY LOAM UPPER 0.2' | 2C2 | SP | 7.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE1730 | 9/10/2006 | 3.6-4.6 | low terrace | 10R 4/2 weak red clay, few 5YR 4/6 yellowish red mottle, moist, massive, moist, very firm, very plastic, FEW COARSE PROMINATE MOTTLES | 3C3 | CL | 20 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2210 | 10/19/2006 | 0.0-0.7 | intermediate terrace | 10YR 2/1 black loam, moist, granular, moist, friable, slightly plastic, few very fine roots | A | ML/CL | 25 | 8 | 120 | 57 | 47 | 110 | 340 | 52 | Alta |
| RO-325+50-NE2210 | 10/19/2006 | 0.7-2.2 | intermediate terrace | 2.5Y 3/1 very dark gray sandy loam, moist, subangular blocky, weak, moist, friable, slightly plastic, Borderline loam. | Cg1 | SC | 16.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2210 | 10/19/2006 | 2.2-2.9 | intermediate terrace | 2.5Y 3/1 very dark gray sandy loam, wet, subangular blocky, weak, moist, friable, slightly plastic, Borderline loam. | Cg1 | SC | 17.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2210 | 10/19/2006 | 2.9-3.3 | intermediate terrace | 2.5Y 5/3 light olive brown and 2.5Y 5/2 grayish brown sand, wet, single grain, moist, loose, Non-plastic | Cg2 | SW | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE2300 | 10/19/2006 | 0.0-0.8 | upper high terrace | 10YR 2/1 black fine sandy loam, moist, granular, weak, moist, very friable, slightly plastic, common very fine roots | A | SM | 20.9 | 10 | 23 | 8 | 10 | 23 | 75 | 20 | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 0.8-1.3 | upper high terrace | 7.5YR 3/3 dark brown fine sand, moist, single grain, moist, loose, Non-plastic, very few coarse roots | A/B | SP | 12.1 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 1.3-1.9 | upper high terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 8.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 1.9-2.3 | upper high terrace | 10YR 5/6 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | BC | SP | 8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 2.3-3.3 | upper high terrace | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 7.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 3.3-4.9 | upper high terrace | 10YR 5/4 yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 8.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE2300 | 10/19/2006 | 4.9-5.5 | upper high terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, Sudrounded well sorted grains. | C2 | SP | 13.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE385 | 9/9/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML | 24.4 | 17 | 5500 | 3000 | 3000 | 3200 | 15000 | 2100 | Dow |
| RO-325+50-NE385 | 9/9/2006 | 0.2-1.1 | low terrace | 10YR 4/3 brown silt loam, moist, subangular blocky, moist, friable, slightly plastic | A/B | ML | 20.1 | 6 | 5400 | 2900 | 2600 | 2600 | 13000 | 1800 | Dow |
| RO-325+50-NE385 | 9/9/2006 | 1.1-2.7 | low terrace | 10YR 4/4 dark yellowish brown very fine sand, moist, subangular blocky, moist, friable, slightly plastic | 2Bt1 | SC | 16 | <4 | 79 | 51 | 52 | 56 | 240 | 35 | Dow |
| RO-325+50-NE385 | 9/9/2006 | 2.7-4.1 | low terrace | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, subangular blocky, moist, friable, moderately plastic, SLIGHTLY TO MODERATELY PLASTIC | 2Bt2 | SC | 13.9 | <4 | 81 | 52 | 45 | 39 | 220 | 32 | Dow |
| RO-325+50-NE385 | 9/9/2006 | 4.1-5.5 | low terrace | 10YR 5/4 yellowish brown loamy very fine sand, moist, subangular blocky, moist, very friable, slightly plastic, LOAMY VERY FINE SAND AND VERY FINE SANDY LOAM | 2C | SC | 13 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE45 | 9/8/2006 | 0.0-0.3 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, friable, slightly plastic, very few fine roots | A | SC | 9.5 | 17 | 35000 | 29000 | 20000 | 12000 | 96000 | 13000 | Dow |
| RO-325+50-NE45 | 9/8/2006 | 0.3-2.3 | high terrace | 10YR 4/3 brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Bw | SC | 10.3 | 7 | 12000 | 5400 | 5400 | 4400 | 27000 | 3800 | Dow |
| RO-325+50-NE45 | 9/8/2006 | 2.3-3.2 | high terrace | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C1 | SC | 10.1 | <4 | 200 | 97 | 87 | 81 | 470 | 65 | Dow |
| RO-325+50-NE45 | 9/8/2006 | 3.2-3.6 | high terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 2.6 | <4 | 1100 | 350 | 340 | 260 | 2000 | 270 | Alta |
| RO-325+50-NE45 | 9/8/2006 | 3.6-4.4 | high terrace | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic, FRESHWATER SHELLS | C3 | SC | 11.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE450 | 9/9/2006 | 0.0-0.3 | wetland | 10YR 4/1 dark gray silt loam, moist, granular, moist, friable, moderately plastic, few very fine roots | A | ML | 24.9 | 40 | 1700 | 990 | 900 | 1500 | 5100 | 720 | Dow |
| RO-325+50-NE450 | 9/9/2006 | 0.0-0.3 Field Duplicate | wetland | 10YR 4/1 dark gray silt loam, moist, granular, moist, friable, moderately plastic, few very fine roots | A | ML | 25.5 | 38 | 2300 | 1200 | 1000 | 1800 | 6400 | 880 | Dow |
| RO-325+50-NE450 | 9/9/2006 | 0.3-0.6 | wetland | 10YR 4/2 dark grayish brown silt loam, moist, subangular blocky, moist, friable, moderately plastic, very few very fine roots | A/C | ML | 20.2 | 15 | 12000 | 5600 | 5600 | 4800 | 27000 | 3800 | Dow |
| RO-325+50-NE450 | 9/9/2006 | 0.6-1.3 | wetland | 10YR 4/3 brown silty clay loam, common mottle, moist, subangular blocky, moist, friable, moderately plastic, COMMON FINE FAINT MOTTLES | C1 | CL | 19.5 | <4 | 3900 | 1900 | 1900 | 1700 | 9400 | 1300 | Dow |
| RO-325+50-NE450 | 9/9/2006 | 1.3-2.3 | wetland | 10YR 5/2 grayish brown silty clay, common 10YR 4/6 dark yellowish brown mottle, moist, moist, firm, very plastic | C2 | CL | 21.1 | <4 | 17 | 9 | 8 | 7 | 41* | <10* | Dow |
| RO-325+50-NE450 | 9/9/2006 | 2.3-3.5 | wetland | 10YR 5/2 grayish brown silty clay, many 10YR 4/6 dark yellowish brown mottle, moist, moist, very firm, very plastic | C3 | CL | 18.8 | <4 | 11 | <4 | <5 | <4 | <21* | <10* | Dow |
| RO-325+50-NE450 | 9/9/2006 | 3.5-4.8 | wetland | 10YR 5/2 grayish brown silty clay, many 10YR 5/8 yellowish brown mottle, moist, moist, very firm, very plastic | C4 | CL | 18.3 | 5 | 12 | <4 | <4 | <6 | <22* | <10* | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE515 | 9/9/2006 | 0.0-0.5 | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, common fine roots, SM and ML SLIGHTLY TO MODERATELY PLASTIC COMMON VERY FINE AND FINE ROOTS | A | SM | 17.1 | 12 | 8600 | 4300 | 4200 | 4100 | 21000 | 2900 | Dow |
| RO-325+50-NE515 | 9/9/2006 | 0.0-0.5 Field Duplicate | low terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, slightly plastic, common fine roots, SM and ML SLIGHTLY TO MODERATELY PLASTIC COMMON VERY FINE AND FINE ROOTS | A | SM | 17.3 | 13 | 8800 | 4600 | 4700 | 3900 | 22000 | 3100 | Dow |
| RO-325+50-NE515 | 9/9/2006 | 0.5-1.0 | low terrace | 10YR 4/2 dark grayish brown loam, moist, subangular blocky, moist, friable, moderately plastic, SM and ML SLIGHTLY TO MODERATELY PLASTIC | Bw | SM | 16.5 | 4 | 2800 | 1300 | 1300 | 1200 | 6500 | 910 | Dow |
| RO-325+50-NE515 | 9/9/2006 | 1.0-2.4 | low terrace | 10YR 3/2 very dark grayish br sandy clay loam, moist, subangular blocky, moist, friable, moderately plastic, FRIABLE TO FIRM | C1 | CL | 16.3 | <4 | 67 | 38 | 38 | 38 | 180 | 27 | Dow |
| RO-325+50-NE515 | 9/9/2006 | 2.4-3.9 | low terrace | 10YR 5/4 yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic | 2C2 | SP | 6.5 | <4 | 20 | 9 | 11 | 7 | 48* | <10* | Dow |
| RO-325+50-NE515 | 9/9/2006 | 3.9-4.4 | low terrace | 10YR 5/3 brown sandy clay, moist, massive, moist, very firm, very plastic, SANDY CLAY TO CLAY CL/CH | 22 | CL | 13.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-325+50-NE560 | 9/9/2006 | 0.0-1.9 Field Duplicate | upland | 10YR 2/2 very dark brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | A | SP | 8.2 | <4 | 790 | 420 | 370 | 370 | 2000 | 270 | Dow |
| RO-325+50-NE560 | 9/9/2006 | 0.0-1.9 | upland | 10YR 2/2 very dark brown fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | A | SP | 8.5 | <4 | 840 | 420 | 380 | 370 | 2000 | 280 | Dow |
| RO-325+50-NE560 | 9/9/2006 | 1.9-2.4 | upland | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | A/B | SP | 5.7 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Dow |
| RO-325+50-NE560 | 9/9/2006 | 2.4-2.9 Lab Duplicate | upland | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, CEMENTED SAND GRAINS (GRAVEL SIZE) | Bs | SP | 5.6 | <4 | <4 | <6 ^{LISR} | <7 ^{LISR} | <14 ^{LISR} | <35 | <10 | Dow |
| RO-325+50-NE560 | 9/9/2006 | 2.4-2.9 | upland | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, CEMENTED SAND GRAINS (GRAVEL SIZE) | Bs | SP | 5.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-325+50-NE560 | 9/9/2006 | 2.9-3.9 | upland | 10YR 6/6 brownish yellow fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 4.4 | <4 | 7 | <4 | <4 | <4 | <20* | <10* | Dow |
| RO-325+50-NE560 | 9/9/2006 | 3.9-4.6 | upland | 7.5YR 5/8 strong brown fine sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 8.7 | <4 | 17 | 5 | 6 | <4 | 28* | <10* | Dow |
| RO-325+50-NE560 | 9/9/2006 | 4.6-5.4 | upland | 10YR 6/6 brownish yellow fine sand, moist, single grain, moist, loose, Non-plastic, CLAY WITH GRAVEL AT THE BOTTOM OF THE PROFILE (0.1') 2.5 Y 5/3 - BROWN. | C3 | SP | 5.8 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE70 | 9/8/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, few very fine roots | A | SC | 12.5 | 10 | 5600 | 2900 | 2600 | 2700 | 14000 | 1900 | Dow |
| RO-325+50-NE70 | 9/8/2006 | 0.3-0.8 | intermediate terrace | 10YR 3/3 dark brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | A/B | SC | 11.6 | 10 | 6200 | 2600 | 2700 | 2400 | 14000 | 1900 | Dow |
| RO-325+50-NE70 | 9/8/2006 | 0.8-1.8 | intermediate terrace | 10YR 4/4 dark yellowish brown fine sandy loam, moist, subangular blocky, moist, very friable, Non-plastic, SUBANGULAR BLOCKY TO SINGLE GRAIN SHELL FRAGMENTS @ 1.8' | Bs | SP | 7 | 14 | 730 | 360 | 350 | 280 | 1700 | 250 | Dow |
| RO-325+50-NE70 | 9/8/2006 | 1.8-3.1 | intermediate terrace | 10YR 4/6 dark yellowish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, 10 YR 6/7 FINE SAND @ 3.0 TO 3.2' | C1 | SP | 4.8 | <4 | 96 | 29 | 24 | 16 | 170 | 23 | Dow |
| RO-325+50-NE70 | 9/8/2006 | 3.1-4.0 | intermediate terrace | 10R 3/4 dusky red loamy fine sand, moist, subangular blocky, moist, very friable, slightly plastic, BROKEN SHELLS FRAGMENTS AT 3.3' | C2 | SP | 8.9 | <4 | 13 | 7 | 6 | 7 | 32* | <10* | Dow |
| RO-325+50-NE70 | 9/8/2006 | 4.0-4.7 | intermediate terrace | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, SHELL FRAGMENTS AT 4.2' | C3 | SP | 2.9 | <4 | <4 | <4 | <4 | <6 | <22 | <10 | Dow |
| RO-325+50-NE840 | 9/10/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br loamy fine sand, moist, granular, moist, very friable, slightly plastic, few fine roots, <2% FINE GRAVEL | A | SC | 11.2 | 4 | 550 | 290 | 280 | 260 | 1400 | 200 | Dow |
| RO-325+50-NE840 | 9/10/2006 | 0.8-2.1 | high terrace | 10YR 5/1 gray sandy clay loam, common 7.5YR 5/8 strong brown mottle, moist, moist, friable, moderately plastic, FINE SANDY CLAY LOAM | C1 | CL | 14.3 | <4 | 8 | 5 | 4 | 5 | 21* | <10* | Dow |
| RO-325+50-NE840 | 9/10/2006 | 2.1-3.3 | high terrace | 10YR 4/1 dark gray sandy clay loam, common 7.5YR 5/8 strong brown mottle, moist, friable, moderately plastic | C2 | CH | 14.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-NE840 | 9/10/2006 | 3.3-4.4 | high terrace | 10YR 5/1 gray sandy clay loam, common 7.5YR 5/8 strong brown mottle, moist, moist, friable, moderately plastic, COMMON MEDIUM PROMINATE MOTTLES FRIABLE TO FIRM | C3 | CL | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-NE90 | 9/8/2006 | 0.0-0.2 | wetland | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML | 24 | 16 | 8700 | 4000 | 4000 | 3900 | 21000 | 2900 | Dow |
| RO-325+50-NE90 | 9/8/2006 | 0.2-1.5 | wetland | 10YR 3/3 dark brown silt loam, moist, subangular blocky, moist, friable, slightly plastic | Bw | ML | 17.7 | 12 | 7700 | 3800 | 3400 | 3300 | 18000 | 2500 | Dow |
| RO-325+50-NE90 | 9/8/2006 | 1.5-2.6 | wetland | 10YR 4/3 brown silt loam, moist, subangular blocky, moist, friable, slightly plastic | C1 | ML | 14.2 | 7 | 370 | 170 | 140 | 160 | 860 | 120 | Alta |
| RO-325+50-NE90 | 9/8/2006 | 2.6-3.5 | wetland | 10YR 3/6 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic, THIN LAYER (0.1') OF FINE SAND 10YR 5/4 @ 2.6' | 2C2 | SP | 8.8 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-325+50-NE90 | 9/8/2006 | 3.5-4.8 | wetland | 10YR 5/4 yellowish brown and 10YR 4/4 dark yellowish brown fine sandy loam, moist, single grain, moist, loose, slightly plastic, INTERBEDED FINE SANDY LOAM AND SANDY LOAM SINGLE GRAIN (SAND) SUBANGULAR (SANDY LOAM) NON-PLASTIC (SAND) LIGHTLY PLASTIC (SANDY LOAM) LOOSE (SAND) FRIABLE (SANDY LOAM) | 2C3 | SP-SC | 6.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-325+50-SW145 | 10/9/2006 | 0.0-1.1 | low terrace | 2.5Y 3/2 very dark grayish br silt loam, moist, subangular blocky, weak, moist, friable, slightly plastic, common very fine roots | A | ML | 45.6 | 27 | 1400 | 830 | 1500 | 1100 | 4900 | 830 | Dow |
| RO-325+50-SW145 | 10/9/2006 | 1.1-2.5 | low terrace | 10YR 3/1 very dark gray silt loam, common 10YR 4/6 dark yellowish brown mottle, wet, subangular blocky, weak, moist, friable, slightly plastic, very few very fine roots | C1 | OL | 67.7 | <8 | 1400 | 860 | 710 | 730 | 3700 | 460 | Dow |
| RO-325+50-SW145 | 10/9/2006 | 2.5-3.6 | low terrace | 2.5Y 3/2 very dark grayish br and 2.5Y 3/1 very dark gray silt loam, wet, moist, friable, slightly plastic, Many very small shells. | C2 | ML | 71.2 | <4 | 190 | 160 | 110 | 130 | 580 | 70 | Dow |
| RO-325+50-SW145 | 10/9/2006 | 3.6-4.4 | low terrace | 5Y 4/2 olive gray silt loam, wet, moist, very friable, slightly sticky, slightly plastic, Few very small shells. Interval 3.6'-4.4' may be marl. | Cg3 | ML | 53 | <4 | <8 LISR | <9 | <4 | <9 | <34 | <10 | Dow |
| RO-325+50-SW190 | 10/9/2006 | 0.0-1.1 | intermediate terrace | 10YR 2/1 black, wet, structureless, many very fine roots, other odor, Sampled 0.0'-1.1', 1.1'-2.2', 2.2'-3.3'. Saturated sapric organic material down to 3.3'. Odor=decaying organic material. | Oa | PT | 67.5 | 14 | 320 | 190 | 160 | 240 | 920 | 120 | Dow |
| RO-325+50-SW190 | 10/9/2006 | 1.1-2.2 | intermediate terrace | 10YR 2/1 black, wet, structureless, many very fine roots, other odor, Sampled 0.0'-1.1', 1.1'-2.2', 2.2'-3.3'. Saturated sapric organic material down to 3.3'. Odor=decaying organic material. | Oa | PT | 83 | <7 | 16 | 9 | 8 | 11 | 43* | <10 * | Dow |
| RO-325+50-SW190 | 10/9/2006 | 2.2-3.3 | intermediate terrace | 10YR 2/1 black, wet, structureless, many very fine roots, other odor, Sampled 0.0'-1.1', 1.1'-2.2', 2.2'-3.3'. Saturated sapric organic material down to 3.3'. Odor=decaying organic material. | Oa | PT | 81.1 | <6 | 14 | 12 | 7 | 12 | 45* | <10 * | Dow |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-SW20 | 9/24/2006 | 0.0-0.6 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, moist, loose, Non-plastic, few very fine roots | A | SP | 13.6 | 10 | 1600 | 590 | 520 | 580 | 3300 | 440 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 0.0-0.6 | intermediate terrace | 10YR 3/2 very dark grayish br fine sand, moist, moist, loose, Non-plastic, few very fine roots | A | SP | 13.7 | 15 | 1700 | 770 | 640 | 770 | 3900 | 530 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 0.6-1.3 | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, dry, single grain, dry, loose, Non-plastic, FINE SAND TO LOAMY FINE SAND | A/C | SP | 5.1 | 52 | 19000 | 8300 | 7000 | 6900 | 41000 | 5500 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 1.3-2.8 | intermediate terrace | 10YR 4/3 brown fine sandy loam, dry, subangular blocky, dry, soft, slightly plastic | C1 | SM | 5.2 | <4 | 4300 | 1900 | 1600 | 1600 | 9500 | 1300 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 2.8-5.5 Field Duplicate | intermediate terrace | 10YR 3/3 dark brown very fine sandy loam, dry, dry, soft, slightly plastic | C2 | SM | 12.7 | <4 | 86 | 39 | 36 | 42 | 200 | 29 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 2.8-5.5 | intermediate terrace | 10YR 3/3 dark brown very fine sandy loam, dry, dry, soft, slightly plastic | C2 | SM | 11.5 | <4 | 110 | 43 | 39 | 42 | 230 | 33 | Alta |
| RO-325+50-SW20 | 9/24/2006 | 5.5-7.4 | intermediate terrace | 10YR 4/4 dark yellowish brown clay, common 10YR 4/6 dark yellowish brown mottle, moist, moist, firm, very plastic | 2C3 | CH | 16.6 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-325+50-SW20 | 9/24/2006 | 7.4-8.8 | intermediate terrace | 10YR 3/1 very dark gray silt loam, common 10YR 3/6 dark yellowish brown mottle, moist, moist, friable, moderately plastic, SOME SPOTS OF CONCENTRATED ORGANIC MATTER MEDIUM PROMINATE MOTTLES | 3C4 | ML/CL | 30.4 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-325+50-SW245 | 10/9/2006 | 0.0-0.3 | high terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, weak, moist, friable, non-sticky, slightly plastic, very few very fine roots | A3 | ML | 27.4 | 8 | 28 | 12 | 15 | 18 | 81 | 19 | Dow |
| RO-325+50-SW245 | 10/9/2006 | 0.3-0.8 | high terrace | 10YR 4/3 brown silty clay loam, moist, angular blocky, weak, moist, friable, slightly sticky, slightly plastic, very few very fine roots | Bt3 | ML/CL | 15.2 | <4 | 12 | 7 | 5 | 6 | 29* | <10 * | Dow |
| RO-325+50-SW245 | 10/9/2006 | 0.8-2.1 | high terrace | 10YR 4/3 brown and 10YR 5/3 brown silt loam, moist, subangular blocky, weak, moist, friable, slightly sticky, slightly plastic, very few medium roots, Slightly lighter color than the Bt horizon. | C1 | ML | 10.9 | <4 | 14 | 7 | 7 | 7 | 36* | <10 * | Dow |
| RO-325+50-SW245 | 10/9/2006 | 2.1-4.2 | high terrace | 7.5YR 5/4 brown clay, common 7.5YR 4/4 brown mottle, moist, massive, moist, very firm, moderately sticky, very plastic, Small pieces of charcoal. | 2C2 | CH | 19.7 | <4 | <5 LISR | <4 | <4 | <4 | <21 | <10 | Dow |
| RO-325+50-SW245 | 10/9/2006 | 4.2-5.5 | high terrace | 2.5Y 5/3 light olive brown silty clay, few 2.5Y 5/4 light olive brown mottle, moist, massive, moist, firm, slightly sticky, very plastic, May be close to a silty clay loam. Some stratification in this horizon. Appears to be finely disseminated carbonates throughout giving a whitish coating in some areas. | 2C3 | ML/CL | 18.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-----------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-325+50-SW40 | 9/24/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML | 27 | 28 | 1500 | 660 | 570 | 640 | 3400 | 470 | Alta |
| RO-325+50-SW40 | 9/24/2006 | 0.0-0.2 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, very few very fine roots | A | ML | 27.4 | 20 | 1400 | 640 | 560 | 640 | 3200 | 450 | Alta |
| RO-325+50-SW40 | 9/24/2006 | 0.2-1.3 | low terrace | 10YR 4/2 dark grayish brown silt loam, few 10YR 4/4 dark yellowish brown mottle, moist, granular, moist, friable, slightly plastic, FEW FINE DISTINCT MOTTLES GRANULAR TO SUBANGULAR | A/C | ML | 14.8 | 29 | 8600 | 5000 | 3600 | 4200 | 22000 | 2800 | Alta |
| RO-325+50-SW40 | 9/24/2006 | 1.3-2.1 | low terrace | 10YR 5/2 grayish brown silt loam, common 10YR 4/6 dark yellowish brown mottle, moist, moist, friable, slightly plastic, COMMON FINE PROMINATE MOTTLES | C1 | ML | 13.2 | 4 | 8400 | 3400 | 3100 | 2600 | 17000 | 2300 | Alta |
| RO-325+50-SW40 | 9/24/2006 | 2.1-4.0 | low terrace | 10YR 3/1 very dark gray , wet, moist, very friable, slightly plastic, many very fine roots, ORGANIC MATERIAL WITH SOME SILTS AND CLAYS HORIZON 2Oeb | 2Oe | PT | 41.6 | <9 | 3900 | 750 | 850 | 570 | 6000 | 800 | Alta |
| RO-325+50-SW40 | 9/24/2006 | 4.0-4.4 | low terrace | 2.5Y 4/1 dark gray silt loam, few 10YR 3/3 dark brown mottle, wet, moist, friable, slightly plastic, FEW FINE DISTINCT MOTTLES MANY FRESHWATER SHELLS | 3C2 | ML | 46.8 | <4 | 11 | 5 | 4 | 5 | 24* | <10* | Alta |
| RO-325+55-NE10 | 11/7/2006 | 8.7-9.8 | natural levee | 10YR 4/4 dark yellowish brown loamy very fine sand, moist, angular blocky, moist, friable, slightly plastic | C9 | SP | 6.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-325+55-NE10 | 11/7/2006 | 9.8-11.7 Field Duplicate | natural levee | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, angular blocky, weak, moist, friable, slightly plastic | C10 | SC | 12.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-325+55-NE10 | 11/7/2006 | 9.8-11.7 | natural levee | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, angular blocky, weak, moist, friable, slightly plastic | C10 | SC | 12.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-327+50-IC-C | 10/16/2006 | 0.0-0.4 | in-channel | 10YR 5/2 grayish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few fine gravel, very few angular glossy black coarse sand, very few shell fragments, subrounded grains | 1 | SM | 8.1 | <4 | 67 | 16 | 16 | 22 | 120 | 18 | Alta |
| RO-327+50-IC-C | 10/16/2006 | 0.4-1.0 | in-channel | 10YR 2/1 black , moist, many medium roots, wood/black material layer | 2 | -- | 44 | 8 | 30000 | 5400 | 7400 | 3300 | 46000 | 6300 | Alta |
| RO-327+50-IC-C | 10/16/2006 | 1.0-1.3 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, very few fine roots, few coarse sand, few fine gravel, very few shell fragments, very few angular glossy black coarse sand, subrounded grains | 3 | SM | 13.8 | <4 | 180 | 53 | 44 | 45 | 320 | 43 | Alta |
| RO-327+50-IC-NE | 10/16/2006 | 0.0-0.7 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, very few fine roots, few fine and medium gravel, few shell fragments, few angular glossy black coarse sand, subrounded grains | 1 | SM | 6.8 | <4 | 30 | 7 | 9 | 21 | 67 | 11 | Alta |
| RO-327+50-IC-NE | 10/16/2006 | 0.7-1.3 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, common medium roots, subrounded grains, wood layer at 0.8' and 1.2' | 2 | SM | 32.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-327+50-IC-SW | 10/16/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, very few angular glossy black coarse sand, subrounded grains, very few shell fragments | 1 | SM | 14.3 | <4 | 11 | <4 | <4 | 10 | 21* | <10 [*] | Alta |
| RO-327+50-IC-SW | 10/16/2006 | 0.3-1.1 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few fine roots, very few coarse sand, very few fine gravel, few shell fragments, few angular glossy black coarse sand, subrounded grains | 2 | SM | 15.7 | <4 | 27 | 5 | 5 | 11 | 48* | <10 [*] | Alta |
| RO-327+50-IC-SW | 10/16/2006 | 1.1-1.2 | in-channel | 10YR 4/1 dark gray loamy very fine sand, <15% gravel, moist, subangular blocky, moist, friable, slightly plastic, few medium roots, very few fine gravel, wood layer at 1.1' | 3 | SM | 37.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 0.0-0.4 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | SM | 24.5 | 42 | 14000 | 6200 | 5200 | 5900 | 32000 | 4200 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 0.4-1.1 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, moderately plastic, few fine roots | C1 | SM | 14.1 | 7 | 13000 | 5100 | 4500 | 4200 | 26000 | 3500 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 1.1-2.0 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy loam, moist, granular, moist, friable, moderately plastic, few fine roots | C1 | SM | 14.1 | <4 | 250 | 110 | 93 | 110 | 560 | 75 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 2.0-3.3 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots | C2 | SM | 13.6 | <4 | 76 | 32 | 27 | 31 | 170 | 24 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 2.0-3.3 Field Duplicate | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots | C2 | SM | 13.7 | <4 | 63 | 25 | 21 | 23 | 130 | 19 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 3.3-4.4 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, moist, granular, moist, very friable, slightly plastic, few fine roots | C2 | SM | 13.3 | <4 | 560 | 160 | 160 | 130 | 1000 | 140 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 4.4-5.1 | intermediate terrace | 10YR 4/4 dark yellowish brown loamy sand, dry, granular, dry, soft, slightly plastic, few fine roots | C2 | SM | 13 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-329+00-NE100 | 11/5/2006 | 5.1-5.5 | intermediate terrace | 10YR 3/4 dark yellowish brown sandy loam, dry, subangular blocky, dry, slightly hard, moderately plastic | C3 | SM | 11.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|------------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-329+00-NE20 | 11/8/2006 | 0.0-0.8 | natural levee | 10YR 3/2 very dark grayish br sandy loam, moist, granular, moist, friable, slightly plastic, common fine roots | A | SM | 13.7 | 110 | 4200 | 2600 | 2000 | 2900 | 12000 | 1600 | Dow |
| RO-329+00-NE20 | 11/8/2006 | 0.8-3.0 | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 3.3 | 20 | 16000 | 6800 | 6300 | 5900 | 35000 | 4700 | Dow |
| RO-329+00-NE20 | 11/8/2006 | 3.0-5.0 | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots, Sample core recovery 3.6' out of 5.0' | C1 | SP | 2.8 | 96 | 160000 | 50000 | 60000 | 40000 | 310000 | 44000 | Dow |
| RO-329+00-NE20 | 11/8/2006 | 5.0-6.0 Field Duplicate | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 5.1 | 57 | 73000 | 25000 | 26000 | 22000 | 150000 | 20000 | Dow |
| RO-329+00-NE20 | 11/8/2006 | 5.0-6.0 | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 5.3 | 54 | 62000 | 19000 | 22000 | 16000 | 120000 | 17000 | Dow |
| RO-329+00-NE20 | 11/8/2006 | 6.0-8.0 Field Duplicate | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 3.7 | 7 | 27000 | 11000 | 8900 | 8100 | 56000 | 7200 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 6.0-8.0 | natural levee | 10YR 4/3 brown loamy sand, dry, single grain, dry, loose, Non-plastic, few fine roots | C1 | SP | 4 | 6 | 26000 | 10000 | 8500 | 7200 | 52000 | 6800 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 8.0-10.0 | natural levee | 10YR 5/4 yellowish brown sand, dry, single grain, dry, loose, Non-plastic, 10YR 4/3 sandy loam layers at 8.0' and 9.5-10' (less than 0.2' thick). From 9.0-10.0' black wood fragments. Sample core recovery 3.8' out of 5.0'. | C2 | SP | 13.5 | <4 | 3300 | 920 | 870 | 520 | 5700 | 740 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 10.0-12.0 | natural levee | 10YR 4/3 brown and 10Y 4/1 dark greenish gray sandy clay loam, few 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C3 | SM | 18.6 | <4 | 84 | 28 | 24 | 19 | 160 | 22 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 10.0-12.0 Field Duplicate | natural levee | 10YR 4/3 brown and 10Y 4/1 dark greenish gray sandy clay loam, few 7.5YR 5/8 strong brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C3 | SM | 16.1 | <4 | 71 | 25 | 23 | 19 | 140 | 20 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 12.0-13.2 | natural levee | 10Y 4/1 dark greenish gray and 10YR 5/3 brown sandy clay loam, moist, subangular blocky, moist, friable, moderately plastic | C4 | SM | 16.6 | <4 | 58 | 15 | 14 | 11 | 98 | 15 | Alta |
| RO-329+00-NE20 | 11/8/2006 | 13.2-14.0 | natural levee | 10Y 3/1 dark greenish gray sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C5 | SM | 20.5 | <4 | 13 | 6 | 5 | 4 | 28* | <10* | Alta |
| RO-329+00-NE20 | 11/8/2006 | 14.0-15.0 | natural levee | 10Y 4/1 dark greenish gray sand, wet, single grain, moist, loose, Non-plastic, Sample core recovery 4.8' out of 5'. Trace of white freshwater snail shells. | C6 | SP | 15.3 | <4 | 35 | 12 | 11 | 9 | 68 | 11 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|-------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-329+00-NE240 | 11/5/2006 | 0.0-0.4 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, few fine roots | A | ML | 28.8 | 33 | 8300 | 3000 | 2500 | 3000 | 17000 | 2200 | Alta |
| RO-329+00-NE240 | 11/5/2006 | 0.4-1.1 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | C | ML/CL | 16.9 | <4 | 8800 | 2100 | 2200 | 1700 | 15000 | 1900 | Alta |
| RO-329+00-NE240 | 11/5/2006 | 1.1-2.2 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | C | ML/CL | 20 | <4 | 130 | 54 | 47 | 54 | 280 | 39 | Alta |
| RO-329+00-NE240 | 11/5/2006 | 2.2-3.3 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic, few fine roots | C | ML/CL | 20 | <4 | 36 | 16 | 14 | 17 | 83 | 13 | Alta |
| RO-329+00-NE240 | 11/5/2006 | 3.3-4.4 | low terrace | 10YR 4/4 dark yellowish brown clay loam, common 10YR 5/6 yellowish brown and 5YR 4/6 yellowish red mottle, moist, subangular blocky, moist, firm, moderately plastic | C | ML/CL | 22.3 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-329+00-NE500 | 11/5/2006 | 0.0-1.1 | low terrace | 10YR 3/2 very dark grayish br loam, few 5YR 4/4 reddish brown mottle, moist, granular, moist, friable, moderately plastic, common fine roots | A | ML | 25.7 | 11 | 2400 | 1200 | 960 | 1100 | 5600 | 750 | Alta |
| RO-329+00-NE500 | 11/5/2006 | 1.1-2.2 | low terrace | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 12.5 | <4 | 88 | 40 | 33 | 41 | 200 | 29 | Alta |
| RO-329+00-NE500 | 11/5/2006 | 2.2-2.7 | low terrace | 10YR 5/3 brown fine sand, moist, single grain, moist, loose, Non-plastic, few fine roots | C1 | SP | 13.2 | <4 | 23 | 10 | 8 | 10 | 52 | <10 * | Alta |
| RO-329+00-NE500 | 11/5/2006 | 2.7-3.3 | low terrace | 10YR 5/4 yellowish brown coarse sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 8.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-329+00-NE500 | 11/5/2006 | 3.3-4.4 | low terrace | 10YR 5/4 yellowish brown coarse sand, wet, single grain, moist, loose, Non-plastic | C2 | SP | 16 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |

NOTES:

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-330+00-SW10 | 11/6/2006 | 0.0-0.3 | natural levee | 10YR 5/3 brown very fine sand, dry, single grain, dry, loose, Non-plastic, very few very fine roots, well sorted subrounded grains | C | SP | 8.4 | 4 | 1100 | 260 | 260 | 220 | 1800 | 240 | Alta |
| RO-330+00-SW10 | 11/6/2006 | 0.3-1.7 | natural levee | 10YR 3/2 very dark grayish br very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common fine roots | A | SM | 12.4 | 18 | 1600 | 590 | 580 | 1300 | 4100 | 550 | Alta |
| RO-330+00-SW10 | 11/6/2006 | 1.7-2.5 | natural levee | 7.5YR 4/3 brown very fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, very few very fine roots | Bw | SM | 14.5 | <4 | 95 | 35 | 41 | 60 | 230 | 34 | Alta |
| RO-330+00-SW10 | 11/6/2006 | 2.5-3.2 | natural levee | 7.5YR 3/4 dark brown loam, dry, subangular blocky, dry, slightly hard, slightly plastic | 2C | SM | 15.7 | <4 | 8 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RO-330+00-SW10 | 11/6/2006 | 3.2-4.8 | natural levee | 7.5YR 4/3 brown sandy clay loam, dry, subangular blocky, dry, moderately hard, moderately plastic | 2C2 | SC | 16 | <4 | 37 | 12 | 11 | 16 | 76 | 12 | Alta |
| RO-330+00-SW10 | 11/6/2006 | 4.8-5.7 | natural levee | 10YR 4/4 dark yellowish brown sandy clay loam, few 7.5YR 3/4 dark brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic | 2C3 | SC | 18.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-330+00-SW10 | 11/6/2006 | 5.7-6.3 | natural levee | 10YR 3/1 very dark gray silt loam, dry, granular, dry, slightly hard, slightly plastic, very few very fine roots | 3C | ML | 22.9 | <4 | 7 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RO-330+00-SW10 | 11/6/2006 | 6.3-6.6 | natural levee | 10YR 4/2 dark grayish brown sandy loam, few 7.5YR 3/4 dark brown mottle, dry, granular, dry, slightly hard, slightly plastic | 3C2 | ML | 19.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-IC-C | 10/16/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown sand, 15<35% gravel, moist, single grain, moist, loose, Non-plastic, common fine gravel, very few angular glossy black coarse sand, very few shell fragments, subrounded grains | 1 | SM | 8.8 | <4 | 11 | <4 | <4 | 4 | <20 * | <10 * | Alta |
| RO-333+00-IC-C | 10/16/2006 | 0.3-0.9 | in-channel | 10YR 4/1 dark gray loamy fine sand, moist, single grain, moist, loose, Non-plastic, few coarse sand, very few fine gravel, few shell fragments, few angular glossy black coarse sand, subrounded grains | 2 | SM | 14.4 | <4 | 22 | 4 | 4 | 6 | 35* | <10 * | Alta |
| RO-333+00-IC-NE | 10/16/2006 | 0.0-0.3 | in-channel | 10YR 4/2 dark grayish brown loamy fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few coarse sand, few fine gravel, few angular glossy black coarse sand, very few shell fragments, subrounded grains | 1 | SM | 12.1 | <4 | 14 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RO-333+00-IC-NE | 10/16/2006 | 0.3-0.9 | in-channel | N 2/0 black loamy fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, very few coarse sand, few shell fragments, few angular glossy black coarse sand, subrounded grains | 2 | SM | 19.2 | <4 | 71 | 15 | 13 | 32 | 130 | 18 | Alta |
| RO-333+00-IC-NE | 10/16/2006 | 0.9-1.1 | in-channel | 10YR 4/2 dark grayish brown sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, very few fine gravel, few shell fragments, subrounded and subangular grains | 3 | SM | 8.4 | <4 | 54 | 9 | 22 | 33 | 120 | 19 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-IC-SW | 10/16/2006 | 0.0-0.6 | in-channel | 10YR 4/2 dark grayish brown coarse sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, very few medium roots, very few fine gravel, few angular glossy black coarse sand, subrounded grains, somewhat well sorted | 1 | SP | 6.7 | <4 | 23 | 7 | 5 | 11 | 46* | <10* | Alta |
| RO-333+00-IC-SW | 10/16/2006 | 0.6-1.3 | in-channel | 10YR 4/1 dark gray loamy fine sand, <15% gravel, moist, single grain, moist, loose, Non-plastic, few coarse sand, very few fine gravel, very few angular glossy black coarse sand, subrounded grains, few shell fragments | 2 | SM | 15.2 | <4 | 21 | <4 | 4 | 10 | 35* | <10* | Alta |
| RO-333+00-NE10 | 9/13/2006 | 0.0-0.7 | natural levee | 2.5Y 5/3 light olive brown and 2.5Y 3/1 very dark gray fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 10.4 | 4 | 630 | 210 | 200 | 220 | 1300 | 170 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 0.7-2.4 | natural levee | 2.5Y 5/3 light olive brown and 2.5Y 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, BROWN FINE SAND WITH FINE LAYERS OF VERY DARK GRAYISH BROWN FINE SAND 2.5Y 3/2 | C2 | SP | 7.5 | 26 | 1100 | 930 | 540 | 910 | 3500 | 460 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 2.4-3.6 | natural levee | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic | C3 | SP | 4.1 | 53 | 3200 | 1400 | 1100 | 1400 | 7200 | 980 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 3.6-4.8 | natural levee | 2.5Y 4/3 olive brown and 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, THIN ALTERNATING LAYERS OF SOIL 1 AND SOIL 2 | C4 | SP | 7.1 | 40 | 2200 | 830 | 970 | 2400 | 6400 | 890 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 4.8-6.0 | natural levee | 10YR 5/4 yellowish brown and 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, TWO THIN BANDS OF OF 2.5 Y 5/3 (0.1') | 2C5 | SP | 4.3 | <9 | 27000 | 13000 | 9700 | 9300 | 58000 | 7600 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 6.0-6.7 | natural levee | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | 2C6 | SC | 12.8 | 20 | 97000 | 37000 | 31000 | 29000 | 190000 | 25000 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 6.7-7.1 | natural levee | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic | 3C7 | SP | 1.7 | <4 | 1700 | 460 | 420 | 470 | 3100 | 400 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 7.1-8.4 | natural levee | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | 4C8 | SC | 10.8 | 9 | 41000 | 14000 | 11000 | 11000 | 77000 | 9800 | Alta |
| RO-333+00-NE10 | 9/13/2006 | 8.4-8.8 | natural levee | 2.5Y 5/3 light olive brown very fine sand, moist, single grain, moist, loose, Non-plastic, THIN LAYER OF LOAMY VERY FINE SAND | 5C9 | SP | 4.2 | 11 | 57000 | 19000 | 17000 | 14000 | 110000 | 14000 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE1000 | 9/11/2006 | 0.0-0.8 Field Duplicate | high terrace | 10YR 3/2 very dark grayish br fine sand, dry, granular, dry, soft, Non-plastic, common very fine roots | A | SP | 8.6 | 5 | 130 | 59 | 48 | 71 | 310 | 45 | Alta |
| RO-333+00-NE1000 | 9/11/2006 | 0.0-0.8 | high terrace | 10YR 3/2 very dark grayish br fine sand, dry, granular, dry, soft, Non-plastic, common very fine roots | A | SP | 7.7 | 4 | 120 | 58 | 49 | 72 | 310 | 44 | Alta |
| RO-333+00-NE1000 | 9/10/2006 | 1.1-1.6 | high terrace | 10YR 3/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | Bs | SP | 5.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE1000 | 9/10/2006 | 1.6-2.2 | high terrace | 10YR 4/4 dark yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | B/C | SP | 2.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE1000 | 9/10/2006 | 2.2-3.3 | high terrace | 10YR 5/4 yellowish brown and 10YR 6/4 light yellowish brow fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 8.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE1000 | 9/10/2006 | 3.3-4.4 | high terrace | 10YR 6/3 pale brown fine sand, wet, single grain, moist, loose, Non-plastic | C2 | SP | 15.3 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/1 very dark gray silt loam, moist, subangular blocky, moist, friable, slightly plastic, very few very fine roots | A | ML | 27 | 15 | 1100 | 500 | 450 | 670 | 2800 | 380 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 0.3-1.2 | intermediate terrace | 10YR 4/2 dark grayish brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic | 2A/B | SC | 14.2 | <4 | 1200 | 480 | 410 | 460 | 2600 | 340 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 1.2-1.4 | intermediate terrace | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | 2E | SP | 6.4 | <4 | 29 | 12 | 11 | 18 | 71 | 11 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 1.4-2.8 | intermediate terrace | 10YR 3/3 dark brown and 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, 2Bhs - HORIZON VERY FINE TO FINE SAND | 2Bh | SW | 8.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-NE115 | 9/13/2006 | 2.8-4.2 | intermediate terrace | 10YR 4/4 dark yellowish brown very fine sand, moist, single grain, moist, loose, Non-plastic, FEW FRESHWATER SHELLS | 2Bs | SW | 11.6 | <4 | 10 | 5 | 4 | 7 | 26* | <10 * | Alta |
| RO-333+00-NE115 | 9/13/2006 | 4.2-5.5 | intermediate terrace | 10YR 4/3 brown loam, moist, moist, friable, slightly plastic, LOAM TO SANDY CLAY LOM SC-CL FRESHWATER SHELLS | 3C1 | SC | 14 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 5.5-6.3 | intermediate terrace | 10YR 3/3 dark brown sandy loam, moist, moist, friable, slightly plastic | 3C2 | SC | 15.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE115 | 9/13/2006 | 6.3-6.5 | intermediate terrace | 10YR 4/3 brown silt loam, moist, moist, friable, slightly plastic | 4C3 | ML | 18.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE1165 | 9/10/2006 | 0.0-0.6 | high terrace | 10YR 2/1 black fine sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots | A | SC | 24.8 | 14 | 470 | 270 | 240 | 330 | 1300 | 190 | Dow |
| RO-333+00-NE1165 | 9/10/2006 | 0.6-2.5 | high terrace | 10YR 2/1 black and 10YR 3/1 very dark gray loamy fine sand, dry, subangular blocky, dry, slightly hard, Non-plastic, SUBANGULAR BLOCKY PARTING TO SINGLE GRAIN | C1 | SC | 7.8 | <4 | 23 | 13 | 13 | 16 | 66 | 11 | Dow |
| RO-333+00-NE1165 | 9/10/2006 | 2.5-3.2 | high terrace | 10YR 6/4 light yellowish brow sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 4.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE1165 | 9/10/2006 | 3.2-4.0 | high terrace | 10YR 5/4 yellowish brown sand, wet, single grain, moist, loose, Non-plastic, LAYER OF FINE AND MEDIUM GRAVEL AT BASE OF C3 (SUBROUNDED) | C3 | SP | 12.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE1165 | 9/10/2006 | 4.0-4.5 | high terrace | 10YR 5/1 gray clay, moist, massive, moist, very firm, very plastic | 2C4 | CH | 17.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE160 | 9/11/2006 | 0.0-0.2 | low terrace | 10YR 3/2 very dark grayish br silt loam, dry, angular blocky, dry, soft, slightly plastic, SILT LOAM SC-ML | A | ML | 23.1 | 34 | 1800 | 680 | 700 | 1200 | 4400 | 620 | Alta |
| RO-333+00-NE160 | 9/11/2006 | 0.2-1.4 | low terrace | 10YR 4/3 brown silt loam, dry, angular blocky, dry, soft, slightly plastic, SILT LOAM (SC-ML) | Bw | ML | 12.6 | <4 | 1300 | 480 | 400 | 360 | 2500 | 330 | Alta |
| RO-333+00-NE160 | 9/11/2006 | 1.4-2.3 | low terrace | 10YR 5/3 brown silt loam, dry, angular blocky, dry, soft, slightly plastic, SILT LOAM SC-ML | C1 | ML | 11.1 | <4 | 6 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE160 | 9/11/2006 | 2.3-3.1 | low terrace | 10YR 4/3 brown silt loam, moist, subangular blocky, moist, friable, slightly plastic, SILT LOAM SC-ML | C2 | ML | 12.4 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE160 | 9/11/2006 | 3.1-3.5 | low terrace | 10YR 3/2 very dark grayish br very fine sand, moist, subangular blocky, moist, friable, slightly plastic | C3 | SC | 12.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE160 | 9/11/2006 | 3.5-4.4 | low terrace | 10YR 4/4 dark yellowish brown very fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | C4 | SC | 14.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE1880 | 9/10/2006 | 0.0-0.4 | low terrace | 10YR 3/1 very dark gray sandy loam, dry, granular, dry, slightly hard, slightly plastic, common very fine roots | A | SC | 22.3 | 14 | 590 | 330 | 300 | 420 | 1700 | 240 | Dow |
| RO-333+00-NE1880 | 9/10/2006 | 0.4-0.9 | low terrace | 10YR 3/2 very dark grayish br loamy fine sand, dry, subangular blocky, dry, soft, Non-plastic | A/C | SP | 10.5 | <4 | 210 | 130 | 110 | 140 | 580 | 81 | Dow |
| RO-333+00-NE1880 | 9/10/2006 | 0.9-2.2 | low terrace | 2.5Y 3/2 very dark grayish br very fine sand, few mottle, dry, subangular blocky, dry, soft, Non-plastic, SUBANGULAR BLOCKY PARTING TO SINGLE GRAIN FEW MEDIUM FAINT MOTTLES | C1 | SP | 6.3 | <4 | <4 | <4 | <4 | <7 | <23 | <10 | Dow |
| RO-333+00-NE1880 | 9/10/2006 | 2.2-3.6 | low terrace | 2.5Y 5/3 light olive brown sand, moist, single grain, moist, loose, Non-plastic | C2 | SP | 6.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE1880 | 9/10/2006 | 3.6-4.2 | low terrace | 10YR 5/3 brown sand, few mottle, wet, single grain, moist, loose, Non-plastic, LAYER OF FINE AND MEDIUM GRAVEL (SUBROUNDED) AT BOTTOM OF C3 HORIZON FEW MEDIUM DISTINCT MOTTLES | C3 | SP | 13 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE1880 | 9/10/2006 | 4.2-4.9 | low terrace | 10YR 5/1 gray clay, common 10YR 4/6 dark yellowish brown mottle, moist, massive, moist, very firm, very plastic, COMMON FINE PROMINATE MOTTLES | 2C4 | CH | 11.6 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Dow |
| RO-333+00-NE300 | 9/11/2006 | 0.0-0.2 | wetland | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, moderately plastic, few very fine roots | A | ML | 23.7 | 80 | 4000 | 1600 | 1300 | 2100 | 9000 | 1200 | Alta |
| RO-333+00-NE300 | 9/11/2006 | 0.2-0.6 | wetland | 10YR 4/2 dark grayish brown silty clay loam, common mottle, moist, subangular blocky, moist, firm, moderately plastic, few medium roots, COMMON FINE FAINT MOTTLES | A/C | CL | 19.3 | 13 | 7000 | 2900 | 2400 | 3000 | 15000 | 2000 | Alta |
| RO-333+00-NE300 | 9/11/2006 | 0.6-1.8 | wetland | 10YR 5/2 grayish brown silty clay loam, common 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C1 | CL | 18.2 | <4 | 190 | 65 | 58 | 64 | 380 | 52 | Alta |
| RO-333+00-NE300 | 9/11/2006 | 1.8-3.3 | wetland | 10YR 5/2 grayish brown silty clay loam, many 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C2 | CL | 17.9 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-NE300 | 9/11/2006 | 3.3-4.0 | wetland | 10YR 5/2 grayish brown silty clay loam, many 10YR 5/6 yellowish brown mottle, moist, subangular blocky, moist, firm, moderately plastic | C3 | CL | 20.5 | <4 | 11 | 5 | 4 | 6 | 26* | <10 * | Alta |
| RO-333+00-NE300 | 9/11/2006 | 4.0-4.4 | wetland | 10YR 4/2 dark grayish brown clay loam, common 10YR 5/6 yellowish brown mottle, moist, moist, firm, very plastic | C4 | CH | 20 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

NOTES:

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DATA FLAGS:

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Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE35 | 9/13/2006 | 0.0-0.6 | high terrace | 10YR 3/1 very dark gray fine sandy loam, moist, granular, moist, very friable, slightly plastic, very few very fine roots | A1 | SC | 22 | 69 | 2000 | 720 | 680 | 1300 | 4800 | 690 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 0.6-1.3 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, very few very fine roots | A2 | SC | 17.2 | 86 | 8100 | 3800 | 3100 | 4800 | 20000 | 2700 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 1.3-2.2 | high terrace | 10YR 4/3 brown fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Bw | SC | 14.1 | 8 | 38000 | 15000 | 13000 | 13000 | 79000 | 10000 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 2.2-3.6 | high terrace | 10YR 5/4 yellowish brown fine sand, few 10YR 5/6 yellowish brown mottle, moist, single grain, moist, loose, Non-plastic, FEW MEDIUM DISTINCT | 2C1 | SP | 4 | <4 | 170 | 40 | 40 | 45 | 290 | 40 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 3.6-4.9 | high terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown fine sandy loam, common 7.5YR 4/6 strong brown mottle, moist, moist, friable, slightly plastic, COMMON MEDIUM DISTINCT MOTTLES (7.5 YR 4/6) THIN LAYERS OF CHARCOAL AT 4.4, 4.6, AND 4.9 FEET. STRATIFIED FINE SANDY LOAM AND LOAMY FINE SAND | 3C5 | SC | 14.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 4.9-5.5 | high terrace | 10YR 4/2 dark grayish brown fine sand, common 5YR 4/6 yellowish red mottle, moist, moist, very friable, slightly plastic, COMMON COARSE PROMINATE MOTTLES | 3C3 | SM | 23.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE35 | 9/13/2006 | 5.5-6.6 | high terrace | 10YR 4/3 brown and 10YR 5/4 yellowish brown fine sandy loam, common 7.5YR 5/6 strong brown mottle, moist, moist, friable, slightly plastic, COMMON MEDIUM DISTINCT MOTTLES LAYERS OF CHARCOAL AT 6.5 FEET | 3C4 | SM | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE350 | 9/11/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br clay loam, moist, subangular blocky, moist, very firm, very plastic | A | CH | 33.8 | 47 | 3800 | 1500 | 1300 | 1900 | 8600 | 1200 | Alta |
| RO-333+00-NE350 | 9/11/2006 | 0.3-1.1 | low terrace | 10YR 4/3 brown silty clay loam, moist, subangular blocky, moist, very firm, moderately plastic | C1 | CL | 20 | 14 | 3100 | 1100 | 900 | 860 | 6000 | 790 | Alta |
| RO-333+00-NE350 | 9/11/2006 | 1.1-2.7 | low terrace | 10YR 4/3 brown silty clay loam, few mottle, moist, subangular blocky, moist, very firm, moderately plastic, SILTY CLAY LOAM TO CLAY LOAM CL-CH FEW FINE FAINT MOTTLES | C2 | CL | 15.5 | <4 | 130 | 52 | 46 | 51 | 280 | 39 | Alta |
| RO-333+00-NE350 | 9/11/2006 | 2.7-4.4 | low terrace | 10R 4/3 weak red silty clay loam, common mottle, moist, subangular blocky, moist, very firm, very plastic, SILTY CLAY LOAM TO CLAY LOAM COMMON FINE DISTINCT MOTTLES | C3 | CL | 18.6 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-NE350 | 9/11/2006 | 4.4-5.5 | low terrace | 10YR 4/3 brown sandy clay loam, many mottle, moist, subangular blocky, moist, very firm, moderately plastic, MANY FINE PROMINATE MOTTLES VERY FINE SANDY CLAY LOAM | C4 | CL | 17.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE440 | 9/11/2006 | 0.0-0.3 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, moderately plastic, SC-ML | A | SC | 23.5 | 55 | 2200 | 950 | 790 | 1300 | 5300 | 740 | Alta |
| RO-333+00-NE440 | 9/11/2006 | 0.3-1.0 | intermediate terrace | 10YR 4/2 dark grayish brown loam, moist, subangular blocky, moist, friable, few very fine roots | Bw | CL | 18.6 | 12 | 5200 | 1500 | 1400 | 1500 | 9700 | 1300 | Alta |
| RO-333+00-NE440 | 9/11/2006 | 1.0-2.0 | intermediate terrace | 2.5Y 3/2 very dark grayish br clay loam, common mottle, moist, subangular blocky, moist, very firm, very plastic, COMMON MEDIUM FAINT MOTTLES | C1 | CH | 17.9 | <4 | 9 | <4 | <4 | 5 | <20 * | <10 * | Alta |
| RO-333+00-NE440 | 9/11/2006 | 2.0-2.4 | intermediate terrace | 2.5Y 3/2 very dark grayish br loamy very fine sand, moist, subangular blocky, moist, very friable, Non-plastic | 2C2 | SP | 9.9 | <4 | 43 | 16 | 13 | 15 | 87 | 13 | Alta |
| RO-333+00-NE440 | 9/11/2006 | 2.4-4.2 | intermediate terrace | 2.5Y 6/4 light yellowish brow very fine sand, moist, moist, loose, Non-plastic | 2C3 | SP | 6.8 | <4 | 5 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-NE440 | 9/11/2006 | 4.2-5.5 | intermediate terrace | 7.5YR 4/6 strong brown and 10YR 5/4 yellowish brown loamy very fine sand, moist, single grain, moist, loose, Non-plastic, ALTERNATING BANDS ABOUT 0.2' IN THICKNESS OF 7.5 YR 4/6 LOAMY VERY FINE SAND, 10YR 5/4 FINE SAND, AND 10YR 6/4 FINE SAND. | 2C4 | SP | 8.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 0.0-0.4 | floodplain | 10YR 4/2 dark grayish brown loamy fine sand, moist, moist, very friable, slightly plastic, many very fine roots | A | SC | 20.6 | 6 | 2900 | 490 | 590 | 340 | 4300 | 570 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 0.4-1.3 | floodplain | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, FINE SAND MIXED WITH A SMALL QUANTITY OF LAOMY FINE SAND | C1 | SP | 22.5 | 6 | 4400 | 1000 | 1100 | 670 | 7200 | 960 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 1.3-1.8 | floodplain | 10YR 2/1 black , HUMIC ORGANIC MATERIAL, DECAYING HORIZON - Oeb | Oe | -- | 51.1 | 17 | 290 | 120 | 110 | 260 | 790 | 120 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 1.8-2.2 | floodplain | 10YR 4/1 dark gray fine sandy loam, moist, subangular blocky, moist, friable, slightly plastic | Cg2 | SC | 38 | 12 | 1100 | 290 | 290 | 360 | 2000 | 280 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 2.2-3.3 | floodplain | fine sandy loam, wet, single grain, moist, loose, Non-plastic, 5 PB 3/1 SC/ML STRUCTURELESS DUE TO SATURATION | Cg3 | SP | 32.6 | 120 | 930 | 370 | 370 | 1200 | 3000 | 490 | Alta |
| RO-333+00-NE5 | 9/13/2006 | 3.3-5.4 | floodplain | sand, wet, columnar, moist, loose, Non-plastic, SAME DECAYING ORGANIC MATTER - MOSTLY WOOD STRUCTURELESS DUE TO SATURATION | Cg4 | SP | 28 | <4 | 2000 | 970 | 710 | 720 | 4400 | 570 | Alta |

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GeoMorph Site Characterization Data Summary

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE505 | 9/11/2006 | 0.0-0.3 | low terrace | 10YR 3/2 very dark grayish br silt loam, moist, granular, moist, friable, slightly plastic, common very fine roots | A | ML | 26.5 | 41 | 1800 | 770 | 650 | 960 | 4200 | 590 | Alta |
| RO-333+00-NE505 | 9/11/2006 | 0.3-1.3 | low terrace | 10YR 4/2 dark grayish brown silt loam, common 10YR 4/6 dark yellowish brown mottle, moist, granular, moist, friable, moderately plastic, common very fine roots, SLIGHTLY TO MODERATELY PLASTIC GRANULAR TO SUBANGULAR BLOCKY COMMON FINE DISTINCT MOTTLES | Bw | ML | 17.5 | 7 | 3500 | 1700 | 1200 | 1400 | 7700 | 1000 | Alta |
| RO-333+00-NE505 | 9/11/2006 | 1.3-3.2 | low terrace | 10YR 4/2 dark grayish brown fine sandy loam, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, friable, slightly plastic, COMMON FINE AND MEDIUM DISTINCT MOTTLES | 2C1 | SM | 13.5 | <4 | 53 | 21 | 20 | 19 | 110 | 17 | Alta |
| RO-333+00-NE505 | 9/11/2006 | 3.2-3.5 | low terrace | 10YR 5/4 yellowish brown sand, moist, single grain, moist, loose, Non-plastic | 3C2 | SP | 9.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE505 | 9/11/2006 | 3.5-4.4 | low terrace | 10YR 5/6 yellowish brown sand, moist, single grain, moist, loose, Non-plastic, MOIST TO WET | 3C3 | SP | 12.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 0.0-0.2 | upland | 10YR 3/2 very dark grayish br fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots | A | SP | 8.6 | 17 | 580 | 270 | 220 | 260 | 1300 | 190 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 0.2-0.7 | upland | 10YR 3/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic, common very fine roots | A/B | SP | 4.6 | <4 | 320 | 130 | 120 | 130 | 700 | 96 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 0.7-1.4 | upland | 10YR 4/6 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 2.8 | <4 | 7 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 1.4-2.2 | upland | 10YR 6/6 brownish yellow fine sand, moist, single grain, moist, loose, Non-plastic | C1 | SP | 2.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 2.2-3.3 | upland | 10YR 6/6 brownish yellow fine sand, moist, moist, loose, Non-plastic | C2 | SP | 3.5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE590 | 9/11/2006 | 3.3-4.4 | upland | 10YR 6/6 brownish yellow fine sand, moist, single grain, moist, loose, Non-plastic, C HORIZON SPLIT BASED ON SAMPLE TUBE LENGTH, NOT SOIL CHARACTERISTICS | C3 | SP | 4.8 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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|---|-----------------|-------------------------|------------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-NE680 | 9/11/2006 | 0.0-0.4 | upland | 10YR 2/1 black loamy fine sand, dry, granular, dry, soft, Non-plastic, many very fine roots | A | SP | 12.8 | 9 | 900 | 280 | 250 | 250 | 1700 | 230 | Alta |
| RO-333+00-NE680 | 9/11/2006 | 0.4-2.3 | upland | 10YR 3/2 very dark grayish br loamy fine sand, dry, single grain, dry, loose, Non-plastic, few fine roots, FEW FINE AND MEDIUM ROOTS | Bw | SP | 5.4 | <4 | 100 | 50 | 36 | 43 | 230 | 31 | Alta |
| RO-333+00-NE680 | 9/11/2006 | 2.3-2.6 | upland | 10YR 5/4 yellowish brown fine sand, dry, single grain, dry, loose, Non-plastic | B/C | SP | 5.9 | <4 | 25 | 14 | 10 | 13 | 62 | 10 | Alta |
| RO-333+00-NE680 | 9/11/2006 | 2.6-3.9 | upland | 10YR 6/6 brownish yellow fine sand, dry, single grain, dry, loose, Non-plastic, < 2% GRAVEL CONCENTRATED IN LOWER 0.1 FEET FO HORIZON | C1 | SP | 3.85 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE680 | 9/11/2006 | 3.9-4.4 | upland | 10YR 5/4 yellowish brown clay, moist, massive, moist, very firm, very plastic, 2-5% FINE GRAVEL | 2C2 | CH | 14.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 0.0-0.3 | historic natural levee | 10YR 3/1 very dark gray very fine sand, moist, subangular blocky, moist, friable, slightly plastic, few fine roots | A1 | SC | 21.1 | 21 | 3900 | 1500 | 1300 | 1600 | 8300 | 1100 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 0.3-1.2 | historic natural levee | 10YR 4/2 dark grayish brown very fine sand, moist, subangular blocky, moist, friable, slightly plastic | A2 | SC | 15.3 | <4 | 1300 | 430 | 400 | 370 | 2500 | 340 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 1.2-2.0 | historic natural levee | 10YR 4/3 brown fine sand, moist, single grain, moist, loose, Non-plastic | A/E | SP | 9.9 | <4 | 180 | 75 | 60 | 73 | 390 | 52 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 2.0-2.6 | historic natural levee | 10YR 5/4 yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | E | SP | 3.4 | <4 | 14 | 5 | 4 | 5 | 28* | <10* | Alta |
| RO-333+00-NE80 | 9/13/2006 | 2.6-3.7 | historic natural levee | 10YR 4/4 dark yellowish brown fine sand, moist, single grain, moist, loose, Non-plastic | Bs | SP | 5 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 3.7-5.5 | historic natural levee | 10YR 4/3 brown and 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, friable, Non-plastic | C1 | SP | 7.7 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-NE80 | 9/13/2006 | 5.5-6.6 | historic natural levee | 10YR 4/3 brown and 10YR 4/4 dark yellowish brown loamy fine sand, moist, subangular blocky, moist, very friable, Non-plastic | C2 | SP | 11.1 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|-------------------------|--------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-SW10 | 9/23/2006 | 0.0-0.2 | high terrace | 2.5Y 5/3 light olive brown fine sand, moist, single grain, moist, loose, Non-plastic, very few fine roots, RECENT FLOOD DEPOSITS | -- | SP | 12.6 | 5 | 1200 | 570 | 550 | 560 | 2900 | 400 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 0.2-0.4 | high terrace | 10YR 3/2 very dark grayish br fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | A | SP | 16.9 | 15 | 3200 | 1400 | 1400 | 1600 | 7600 | 1000 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 0.4-0.8 | high terrace | 2.5Y 3/3 dark olive brown very fine sand, moist, single grain, moist, loose, Non-plastic, few very fine roots | A/C | SP | 8.7 | 16 | 6500 | 2900 | 2700 | 2900 | 15000 | 2000 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 0.8-1.9 | high terrace | 10YR 4/3 brown very fine sand, moist, single grain, moist, loose, Non-plastic | 2C1 | SP | 6.8 | 16 | 16000 | 5600 | 5400 | 4500 | 31000 | 4200 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 1.9-2.6 | high terrace | 10YR 3/2 very dark grayish br fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | 2C2 | SC | 12.1 | <4 | 2500 | 850 | 930 | 620 | 4900 | 680 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 2.6-3.0 | high terrace | 10YR 3/2 very dark grayish br and 10YR 3/3 dark brown fine sandy loam, dry, subangular blocky, dry, slightly hard, slightly plastic | 2C3 | SM | 13.6 | <4 | 830 | 210 | 250 | 140 | 1400 | 200 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 3.0-4.9 | high terrace | 10YR 4/4 dark yellowish brown, dry, subangular blocky, dry, slightly hard, SC/SM | 2C4 | SM | 9.9 | <4 | 2300 | 930 | 840 | 570 | 4600 | 620 | Dow |
| RO-333+00-SW10 | 9/23/2006 | 4.9-5.5 | high terrace | 10YR 4/3 brown clay loam, common 10YR 4/4 dark yellowish brown mottle, dry, subangular blocky, dry, slightly hard, moderately plastic, COMMON FINE FAINT MOTTLES | 3C5 | CL | 13 | <4 | 11 | 6 | 5 | 5 | 26* | <10* | Dow |
| RO-333+00-SW10 | 9/23/2006 | 5.5-7.1 | high terrace | 10YR 4/2 dark grayish brown sandy clay, common 10YR 4/4 dark yellowish brown mottle, dry, angular blocky, dry, slightly hard, moderately plastic, COMMON FINE DISTINCT MOTTLES | 3C6 | CL | 14.5 | <4 | 19 | 9 | 10 | 8 | 45* | <10* | Dow |
| RO-333+00-SW10 | 9/23/2006 | 7.1-7.7 | high terrace | 10YR 5/3 brown sandy clay loam, common 10YR 4/6 dark yellowish brown mottle, dry, angular blocky, dry, slightly hard, moderately plastic | 3C7 | CL | 14.5 | <4 | <4 | <4 | <4 | <5 | <21 | <10 | Dow |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-SW240 | 9/24/2006 | 0.0-0.2 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common very fine roots, LOAM TO SILT LOAM | A | ML | 26.7 | 11 | 6900 | 3000 | 2400 | 2300 | 15000 | 1900 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 0.0-0.2 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, common very fine roots, LOAM TO SILT LOAM | A | ML | 25.6 | 12 | 6600 | 2900 | 2300 | 2300 | 14000 | 1900 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 0.2-1.2 | intermediate terrace | 10YR 4/2 dark grayish brown loam, moist, granular, moist, friable, slightly plastic, GRANULAR TO SUBANGULAR BLOCKY | A/B | ML | 18.8 | 7 | 10000 | 3900 | 3200 | 2400 | 20000 | 2600 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 1.2-1.9 | intermediate terrace | 10YR 4/4 dark yellowish brown loam, moist, subangular blocky, moist, friable, moderately plastic, LOAM TO CLAY LOAM FRIABLE TO FIRM | Bw | CL | 23.6 | <4 | 310 | 110 | 100 | 81 | 610 | 83 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 1.9-2.5 | intermediate terrace | 10YR 3/1 very dark gray loam, moist, granular, moist, friable, moderately plastic, very few fine roots, GRANULAR TO SUBANGULAR BLOCKY FEW VERY FINE AND FINE ROOTS | 2Ab | CL | 21.1 | <4 | 410 | 180 | 150 | 140 | 880 | 120 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 2.5-4.4 | intermediate terrace | 10YR 4/3 brown loam, few 10YR 4/4 dark yellowish brown mottle, moist, moist, friable, moderately plastic, LOAM TO CLAY LOAM FRIABLE TO FIRM FEW FINE FAINT MOTTLES | 2C1 | CL | 21.1 | <4 | 55 | 24 | 18 | 18 | 110 | 17 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 4.4-5.2 | intermediate terrace | 10YR 5/3 brown loam, common 10YR 4/6 dark yellowish brown mottle, moist, moist, friable, moderately plastic, FRIABLE TO FIRM COMMON FINE DISTINCT MOTTLES MANY SMALL FRESHWATER SHELLS DARKER LAYER AT 5.0-5.2 (10YR 4/2) | 2C2 | CL | 22.7 | <4 | 8 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-SW240 | 9/24/2006 | 5.2-6.1 | intermediate terrace | 10YR 5/3 brown loam, many 7.5YR 4/6 strong brown mottle, moist, moist, friable, moderately plastic, LOAM TO CLAY LOAM MANY FINE PROMINENT MOTTLES MANDY FRESHWATER SHELLS | 23 | CL | 25.9 | <4 | 120 | 40 | 35 | 35 | 230 | 32 | Alta |
| RO-333+00-SW240 | 9/24/2006 | 6.1-6.6 | intermediate terrace | 5Y 6/2 light olive gray silt loam, wet, moist, loose, slightly plastic, SOME FRESHWATER SHELLS | 2C4 | ML | 31.9 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |

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GeoMorph Site Characterization Data Summary

Upper Tittabawassee River: Reach O

Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-SW30 | 9/23/2006 | 0.0-0.5 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots, SC/SM VERY FINE AND FINE ROOTS | A | SC | 16.8 | 13 | 1600 | 660 | 760 | 1000 | 4000 | 570 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 0.0-0.5 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, very friable, slightly plastic, common very fine roots, SC/SM VERY FINE AND FINE ROOTS | A | SC | 16.6 | 15 | 1500 | 850 | 810 | 1100 | 4300 | 600 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 0.5-1.5 | intermediate terrace | 10YR 4/2 dark grayish brown fine sand, dry, subangular blocky, dry, soft, Non-plastic | A/C | SP | 6.6 | 17 | 3000 | 1500 | 1500 | 2000 | 7900 | 1100 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 1.5-1.8 | intermediate terrace | 10YR 4/3 brown fine sand, dry, single grain, dry, loose, Non-plastic | C1 | SP | 2.5 | 8 | 2600 | 1300 | 1500 | 2200 | 7600 | 1100 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 1.8-2.3 | intermediate terrace | 10YR 4/2 dark grayish brown sandy clay loam, dry, angular blocky, dry, slightly hard, slightly plastic, SLIGHTLY TO MODERATELY PLASTIC | 2C2 | CL | 9 | 5 | 4800 | 2900 | 2400 | 2500 | 13000 | 1700 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 2.3-3.3 | intermediate terrace | 10YR 4/4 dark yellowish brown clay loam, dry, angular blocky, dry, slightly hard, moderately plastic | 2C3 | CL | 11.8 | <4 | 430 | 220 | 190 | 200 | 1000 | 140 | Dow |
| RO-333+00-SW30 | 9/23/2006 | 3.3-5.5 | intermediate terrace | 10YR 5/3 brown sandy clay loam, many 10YR 4/6 dark yellowish brown mottle, moist, moist, friable, slightly plastic, SANDY CLAY LOAM, FINE SANDY LOAM, AND LOAMY FINE SAND - SC/CL | 2C4 | SC | 10.1 | 12 | 210 | 110 | 110 | 110 | 550 | 88 | Dow |
| RO-333+00-SW30 | 10/24/2006 | 5.5-6.6 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, dry, subangular blocky, moist, friable, slightly plastic | 2C5 | SM | 9.6 | <4 | 6 | <4 | 10 | 45 | 61 | 11 | Alta |
| RO-333+00-SW30 | 10/24/2006 | 6.6-7.7 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, dry, subangular blocky, moist, friable, slightly plastic | 2C5 | SM | 9.9 | <4 | 20 | 8 | 8 | 9 | 45* | <10* | Alta |
| RO-333+00-SW30 | 10/24/2006 | 7.7-8.8 | intermediate terrace | 10YR 5/4 yellowish brown sandy loam, common 10YR 5/8 yellowish brown mottle, dry, subangular blocky, moist, friable, slightly plastic, 10 YR 5/4 (Yellowish brown) single grain sand (SP) layers <0.1 ft thick Black soft particles >0.5 cm (organic matter?) | 2C5 | SM | 15.9 | <4 | 19 | 6 | 7 | 4 | 36* | <10* | Alta |

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Midland, Michigan

| Transect Location/Sample Identification | Collection Date | Depth Interval (ft,bgs) | Geomorphic Setting | Physical Description | Soil Horizon | USCS | Moisture Content (%) | 2,3,7,8-TCDD (ng/kg) | 2,3,7,8-TCDF (ng/kg) | 1,2,3,7,8-PeCDF (ng/kg) | 2,3,4,7,8-PeCDF (ng/kg) | 1,2,3,4,7,8 + 1,2,3,6,7,8-HxCDF (ng/kg) | Aggregate Indicator Congener Concentration (ng/kg) | Estimated Total TEQ (ppt) | Laboratory |
|---|-----------------|----------------------------|----------------------|--|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+00-SW315 | 9/24/2006 | 0.0-0.4 Field Duplicate | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots, SLIGHTLY TO MODERATELY PLASTIC | A | CL | 28 | 8 | 1000 | 440 | 370 | 350 | 2200 | 300 | Alta |
| RO-333+00-SW315 | 9/24/2006 | 0.0-0.4 | low terrace | 10YR 3/2 very dark grayish br loam, moist, granular, moist, friable, slightly plastic, very few very fine roots, SLIGHTLY TO MODERATELY PLASTIC | A | CL | 29.2 | 8 | 560 | 200 | 190 | 210 | 1200 | 160 | Alta |
| RO-333+00-SW315 | 9/24/2006 | 0.4-1.3 | low terrace | 10YR 4/4 dark yellowish brown loam, moist, subangular blocky, moist, friable, slightly plastic, SLIGHTLY TO MODERATELY PLASTIC | Bw | CL | 25.8 | <4 | 74 | 31 | 25 | 25 | 160 | 22 | Alta |
| RO-333+00-SW315 | 9/24/2006 | 1.3-4.1 | low terrace | 10YR 5/3 brown and 10YR 4/3 brown loam, common 10YR 4/6 dark yellowish brown mottle, moist, moist, friable, slightly plastic, LOAM TO SILT LOAM COMMON FINE DISTINCT MOTTLES SMALL SHELLS THIN LAYER AT THE TOP OF THE HORIZON - CONTAINS MORE ORGANIC MATER (10YR 3/1) THIN ORGANIC RICH LAYER AT 1.3 FEET MAY BE BURIED INCIPENT a HORIZON | C1 | ML | 28 | <4 | 4 | <4 | <4 | <4 | <20 * | <10 * | Alta |
| RO-333+00-SW315 | 9/24/2006 | 4.1-4.4 | low terrace | 5Y 6/2 light olive gray silt loam, wet, moist, loose, slightly plastic, COMMON FINE PROMINATE MOTTLES AT TRANSITION WITH C1 C2 HORIZON MAY BE MARL. | C2 | -- | 35.2 | <4 | <4 | <4 | <4 | <4 | <20 | <10 | Alta |
| RO-333+00-SW60 | 9/23/2006 | 0.0-0.2 Field Duplicate | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, few coarse roots | A | SC | 20.5 | 12 | 2900 | 1000 | 1100 | 1300 | 6400 | 880 | Dow |
| RO-333+00-SW60 | 9/23/2006 | 0.0-0.2 | intermediate terrace | 10YR 3/2 very dark grayish br fine sandy loam, moist, granular, moist, friable, slightly plastic, few coarse roots | A | SC | 20.8 | 11 | 2200 | 1100 | 1100 | 1300 | 5700 | 800 | Dow |
| RO-333+00-SW60 | 9/23/2006 | 0.2-1.2 | intermediate terrace | 10YR 4/3 brown fine sandy loam, moist, subangular blocky, moist, very friable, slightly plastic, few fine roots, SC/SM | A/C | SC | 10.9 | 8 | 3400 | 1600 | 1800 | 1900 | 8600 | 1200 | Dow |
| RO-333+00-SW60 | 9/23/2006 | 1.2-2.3 | intermediate terrace | 10YR 4/4 dark yellowish brown sandy clay loam, moist, angular blocky, moist, friable, moderately plastic | 2C1 | CL | 15.5 | <4 | 290 | 130 | 130 | 140 | 690 | 98 | Dow |
| RO-333+00-SW60 | 9/23/2006 | 2.3-2.9 | intermediate terrace | 10YR 3/2 very dark grayish br loam, moist, angular blocky, moist, friable, slightly plastic, SLIGHTLY TO MODERATELY PLASTIC | 3C2 | SC | 17.7 | <4 | 13 | 7 | 6 | 9 | 35* | <10 * | Dow |
| RO-333+00-SW60 | 9/23/2006 | 2.9-4.8 | intermediate terrace | 10YR 4/3 brown , common 10YR 4/4 dark yellowish brown mottle, moist, subangular blocky, moist, very friable, VERY FRIABLE TO FRIABLE COMMON FINE FAINT MOTTLES | 32 | SC | 14.4 | <4 | 37 | 20 | 21 | 24 | 100 | 16 | Dow |
| RO-333+00-SW60 | 9/23/2006 | 4.8-5.5 | intermediate terrace | 10YR 5/3 brown loamy very fine sand, common 10YR 4/6 dark yellowish brown mottle, moist, subangular blocky, moist, very friable, Non-plastic, COMMON COARSE DISTINCT MOTTLES | 4C4 | SC | 10.3 | <4 | 5 | <4 | <4 | 5 | <20 * | <10 * | Dow |

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|---|-----------------|-------------------------|--------------------|---|--------------|------|----------------------|----------------------|----------------------|-------------------------|-------------------------|---|--|---------------------------|------------|
| RO-333+05-NE10 | 11/7/2006 | 8.8-10.9 | natural levee | 10YR 6/4 light yellowish brow and 10YR 4/2 dark grayish brown very fine sand, moist, structureless, moist, loose, Non-plastic, thin layers of sandy clay loam (10YR 4/2) at 9.1', 9.4' and 10.4' | 5C10 | SP | 13.1 | 14 | 6000 | 1700 | 1800 | 1100 | 11000 | 1500 | Dow |
| RO-333+05-NE10 | 11/7/2006 | 10.9-12.1 | natural levee | 2.5Y 5/2 grayish brown very fine sand, moist, structureless, moist, loose, Non-plastic, very few fine roots, decomposing wood fragments from 11.6-11.8' | 5C11 | SP | 25.1 | <4 | 51 | 20 | 17 | 11 | 100 | 15 | Dow |
| RO-333+05-NE10 | 11/7/2006 | 12.1-13.5 | natural levee | 10YR 4/1 dark gray and 10YR 5/1 gray fine sand, wet, structureless, moist, loose, Non-plastic, almost entirely decomposing wood fragments, mostly infilled with fine sand and some sandy clay loam. Horizon divided for sample analysis | Cg | SP | 37.7 | <4 | 26 | 10 | 11 | 8 | 56 | 10 | Dow |
| RO-333+05-NE10 | 11/7/2006 | 13.5-15.0 | natural levee | 10YR 4/1 dark gray and 10YR 5/1 gray fine sand, wet, structureless, moist, loose, Non-plastic, almost entirely decomposing wood fragments, mostly infilled with fine sand and some sandy clay loam. Horizon divided for sample analysis | Cg | SP | 42.8 | <4 | 35 | 15 | 15 | 10 | 74 | 12 | Dow |

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